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ABSTRACT

The Cooperative Reading Project's purpose was to examine the relative effectiveness of three approaches to the teaching of beginning reading and the effectiveness of oral stimulation. This monograph reports the results of the last year of the project. The experimental reading treatments were: (1) the Initial Teaching Alphabet (ITA), (2) the Words in Color (WIC) program, and (3) a Supplemented Conventional Reading Program (SCRP) which used a basic reader plus additional phonics material. Five hundred and thirty-eight subjects were used; the program's effectiveness was evaluated by the Metropolitan Achievement Test, the Illinois Test of Psycholinguistic Abilities, the Peabody Language Production Inventory, and the Stanford-Binet Intelligence Scale. The results obtained from this two year intervention gave only partial confirmation to the experimental hypothesis--that children in experimental reading groups would show greater achievement than those in control groups. Students in the SCRP group did better than those in the ITA or WIC groups. In general, the experimental reading results seem to support the inclusion of systematic phonic instruction in traditional orthography for disadvantaged children. [Due to the size of the print, data on several tables will not be clearly discernible in hard copy reproduction.] (Author/JW)

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IMRID Behavioral Science Monograph No. 10

THE EFFECTIVENESS OF THREE READING APPROACHES AND AN ORAL LANGUAGE STIMULATION PROGRAM WITH DISADVANTAGED CHILDREN IN THE PRIMARY GRADES: A FINAL REPORT AFTER TWO YEARS OF THE COOPERATIVE READING PROJECT

by

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Institute on Mental Retardation and Intellectual Development
George Peabody College for Teachers
Nashville, Tennessee
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PREFACE

The Cooperative Reading Project is a research effort involving three agencies: (1) the Institute on Mental Retardation and Intellectual Development (IMRID) of George Peabody College, (2) the Nashville Educational Improvement Project (NEIP), and (3) the Metropolitan Public Schools of Nashville-Davidson County (METRO). IMRID has been responsible for designing and conducting the study, for the training of teachers, and for the in-service programs during the intervention treatments, utilizing funds from NICHD grant # HD973. NEIP has furnished most of the financial support as one of its efforts to promote improved education for underprivileged children of Nashville. The Metropolitan Schools have provided the teachers and schools to make the study possible. Therefore, this project is truly a cooperative endeavor requiring the effort of all three agencies.

Financial support for the research aspects of this investigation were provided jointly by Ford Foundation funds through NEIP, and by grant #HD-973 from the National Institute of Child Health and Human Development which provides the basic funding for IMRID. Funding for the large service component of the study was financed by the Nashville Metro Schools as part of its ongoing program.

A great number of people have contributed materially to the success of this project. The authors are especially indebted to Mrs. Carrie Denny and Mr. M. D. Neely--Supervisors in the Nashville Metro Schools--for their extensive assistance in all aspects of the project, especially in helping to integrate the experimental program smoothly into the schools. Mr. N. A. Crippens also deserves special recognition. As Director of the Nashville Educational Improvement Project, he was not only primarily responsible for provision of financial assistance but also a major source of professional support.

We want to extend special thanks to Mrs. Otie Officer who supervised the teachers using the Initial Teaching Alphabet in teaching beginning reading, to Mrs. Evelyn Thompson who had a similar role in working with the teachers employing the Supplemented Conventional Reading Program, and to Mrs. Ann Pfost who worked with the Words In Color teachers. The work of Mrs. Margaret Pino in supervising the teachers in the use of the lessons from the Peabody Language Development Kits is also gratefully acknowledged.

We particularly wish to express our appreciation to the following teachers, principals, and other personnel who made this two-year intervention project possible.

Experimental teachers: Mary W. Alexander, Nella Battle, Sarah E. Brown, Patricia A. Campbell, Marilyn Crinel, Eleanor Davis, Effie D. Ervin, Elizabeth D. Hale, Patricia E. Haynes, Lillie Herring, Edith B. Jordan, Ruth Ann Manier, Mildred Massey, Dorothy Mason, Tennie M. McGill, Beverly Ann Noe, Mrs. Norris C. Oten, Maggie L. Parrish, Mary Parrish, Ollie Phelps, Lois H. Saffold, Gwendolyn Smith, Josie L. Stinson, Mattie C. Thompson, Teddy Jo Throneberry Gwendolyn H. Vincent, Mary J. Waller, Sara Wilhoite, Elizabeth Wortham.

Teacher aid: Mary Kimble

School principals: Harold Cauthen, Carolyn Embry, William J. Gupton, W. C. Huddleston, Carrie Jones, Kathryn Millspaugh, F. B. Shockley, Franklin Taylor, M. E. Tipton, and William E, Turner, Jr.

Research assistants: Betty Banks, Lynn Crompler, Kathy Friedman, Linda Gray, Kenneth Jost, and Stan Wiggins.

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Finally, recognition is due the examiners without whom the important evaluation data on the project could not have been obtained. We are hopeful that the results of this project will provide new information to educators of sufficient import to warrant the extensive efforts of all these people.

L.M.D.
D.N.
P.P.
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CHAPTER I

INTRODUCTION

This research endeavor is a direct outgrowth of an earlier study, entitled the "Cooperative Language Development Project (CLDP)" conducted under the auspices of the same three agencies as the present investigation. These agencies were the Institute on Mental Retardation and Intellectual Development of Peabody College, the Nashville Educational Improvement Project, and the Nashville-Davidson County Metropolitan Schools. In the CLDP, the efficacy of the Initial Teaching Alphabet for teaching beginning reading, and of the lessons from the Peabody Language Development Kits for stimulating oral language, were investigated with disadvantaged children in the primary grades (Dunn & Mueller, 1966). Early findings indicated significant pupil growth for both approaches, compared to control pupils who were not provided with these two intervention treatments. On the basis of these results, it was concluded that a language program using ITA and PLDK enhances the school progress of disadvantaged children. However, the possibility that these results may have been caused, to some unknown degree, by the Hawthorne Effect cannot be ignored. The experimental teachers were given a number of incentives not available to the control-teachers--including a small salary supplement, in-service training sessions, and some extra consultation. Furthermore, frequent visits to the experimental classes were made by the researchers, school officials, and visitors who praised the pupils' progress. Consequently, the question arises as to whether the initial teaching alphabet is significantly superior to other approaches in teaching beginning reading to disadvantaged children when all teachers in each of the treatments are provided with extra support and incentives. The central purpose of the present study, entitled the "Cooperative Reading Project (CRP)," was to deal with this question.

Purpose

With comparable teacher incentives and support, the central aim of the project was to examine the relative effectiveness of three approaches of teaching beginning reading and the influence of an oral language stimulation program on the development of disadvantaged children through a treatment which extended over their first two years in school. Performance in language development, intellectual growth, and academic achievement was measured. This monograph provides results on the Cooperative Reading Project at the termination of the two-year treatment period. The study, which began in the Fall of 1965, encompasses a three-year period. A one-year follow-up study will be completed in the Spring, 1968, after the subjects have completed their third grade.*

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* An attempt may be made to follow-up on pupil progress through the junior high school level.

Research Design

Subjects were enrolled in twelve elementary schools, with nine schools involved in the experimental programs and three providing non-treatment, control subjects. All these schools were located in low socio-economic areas of the inner city of Nashville, and the majority served mostly children of the Negro race.

The three experimental reading treatments were: (1) a highly-phonic, basal reading approach using the 44 sound-symbol, Initial Teaching Alphabet (ITA), (2) the Words In Color (WIC) program which introduces each of the 47 speech sounds of the English language (as identified by the author) through the use of a distinct color, (3) and a Supplemented Conventional Reading Program (SCRP) combining a basic reader series with a systematic phonics program. In addition to the reading treatments, two-thirds of the classes in the experimental treatments during the first year of the project received an oral stimulation program utilizing the final edition of Level #1 of the Peabody Language Development Kits (PLDK). During the second year, half of these classes using PLDK #1 received Level #2 of the PLDK. The yearly PLDK program consisted of 180 thirty-minute daily lessons designed to stimulate oral language and verbal intelligence, and thus enhance school progress.

Nine experimental treatment conditions were established at the outset of the experiment. (Each of the nine consisted of three teachers who were committed to keeping their pupils through both of the first two years of school.) For each of the three approaches to beginning reading--ITA, WIC, SCRP--three oral language conditions were set up. Within each reading treatment, one-third of the children received no PLDK, one-third received one year of PLDK, and one-third received two years of PLDK. This yielded the nine experimental groups identified in Figure 1. Examination of Figure 1 will reveal that Groups 1, 4, and 7 (the without PLDK groups) received no special oral language stimulation treatment. Thus, they received solely one of the three reading approaches as the experimental treatment. Groups 2, 5, and 8 (or the one year PLDK groups) received, in addition to the experimental reading treatment, oral language stimulation for the first year of the project only, based on Level #1 of the PLDK. Groups 3, 6, and 9 (or the two year PLDK groups) received, in addition to the experimental reading treatment, two years of PLDK oral language stimulation exercises: Level #1 during the first year of the project, and Level #2 during the second year.

Besides the nine experimental groups, a control group was established. Teachers and pupils in the control group (group 10) did not participate in any of the experimental treatments or incentives. The classes were only visited for pre-testing, and for re-testing after each school year of the project.

Duration of the Oral Language Stimulation Program	Method of Teaching Beginning Reading			
	ITA	WIC	SCRP	Controls
Without PLDK	Group 1 3 classes	Group 4 3 classes	Group 7 3 classes	Group 10 3 classes
One-year PLDK	Group 2 3 classes	Group 5 3 classes	Group 8 3 classes	
Two-year PLDK	Group 3 3 classes	Group 6 3 classes	Group 9 3 classes	

Fig. 1. The basic research design for the Cooperative Reading Project.[1]

In summary, the following 10 groups were constituted:

Group 1 ITA followed by a basal reader without PLDK
Group 2 ITA followed by a basal reader plus one year of PLDK
Group 3 ITA followed by a basal reader plus two years of PLDK
Group 4 WIC followed by a basal reader without PLDK
Group 5 WIC followed by a basal reader plus one year of PLDK
Group 6 WIC followed by a basal reader plus two years of PLDK
Group 7 Basal reader plus Hay-Wingo drill without PLDK
Group 8 Basal reader plus Hay-Wingo drill plus one year of PLDK
Group 9 Basal reader plus Hay-Wingo drill plus two years of PLDK
Group 10 Control group (no experimental treatments or incentives)

---

[1] During the second year of the project, the school system found it necessary to combine certain classrooms. This resulted in a change from three to two classes in the WIC group which received one year of PLDK, as well as in the SCRP group which did not receive PLDK. This resulted in a loss of one class each for Groups 5 and 7.

Finally, all experimental teachers participated at Peabody College in pre-service training at the outset of the experiment and then in regularly-scheduled, in-service training sessions throughout both school years of the experimental aspects of the project. Each of the treatment groups had a consultant who visited the experimental classes regularly and conducted the regularly-scheduled, in-service meetings throughout the duration of the project. For the extra time which was given to in-service meetings, the teachers in the experimental groups received a small stipend of $300 each year. Furthermore, supplementary instructional materials were furnished to all classrooms in the experimental treatment programs only.

Hypotheses

The following predictions were made:

1. Children learning to read through any of the three experimental reading approaches would show significantly greater gains in reading achievement than would the control-group children learning to read in a standard, primary-grade program, with no significant difference among the three experimental reading programs.

2. Children receiving an oral language stimulation treatment, in addition to the experimental reading program, would show significantly greater gains in intellectual functioning, language development, and reading achievement than would children receiving no oral language stimulation.

3. Children receiving two years of oral language stimulation treatment would show significantly greater gains in intellectual functioning, language development, and reading achievement than would children receiving it for only one year.

Analysis of Results

For the primary analyses, it was agreed that an analysis of variance (covariance if necessary) would be used to compare treatments among the groups. For the secondary analysis, multiple comparison techniques (*t*-tests) were to be employed to contrast differences between pairs of subgroups. The .90 level of confidence was to be used throughout, since this was an intervention study in education.

Background on the Characteristics of Disadvantaged Children

The educational retardation of the underprivileged youngster has become an increasing public concern in the past decade. These youngsters enter school at an educational disadvantage when compared with those from more favorable environments. This initial disadvantage leads to progressive retardation as they move through the schools. Deutsch (1965) has coined the term "cumulative deficit" to describe the tendency of disadvantaged children to fall increasingly behind in academic subjects with each successive grade. Deutsch contends that small deficits early in school lead to inferior learning, which in turn increases the magnitude of the deficit. There is ample evidence that Deutsch's claim of progressive retardation exists in the area of reading achievement.

Epidemiological surveys find that poor reading is about four to ten times more common among low socioeconomic status groups in comparison to the prevalence reported for the school population (Chandler, 1966; Deutsch, 1966; Eisenberg, 1966). In one study, only 36 percent of 6,000 culturally disadvantaged primary school children were found to be reading at the appropriate grade level (Shepard, 1962). Eisenberg (1966) found the rate of reading difficulty in a large metropolitan area three times greater among sixth grade Negro children in comparison to their Caucasian peers (36 versus 12 percent). The rate of reading failure among Negro boys was 42 percent. Data from studies by Sexton (1961), Edwards and Wilson (1961), Campbell and Coleman (1966), and Deutsch (1964) also indicates that reading retardation is conspicuous for its frequency among disadvantaged children.

Few studies have investigated the reading characteristics of disadvantaged children. Hanson and Robinson (1967) contrasted the performances of Negro disadvantaged children to groups of children from average and advantaged socioeconomic status backgrounds on tests of reading achievement and reading readiness. The authors concluded that "in comparison to advantaged children, the disadvantaged evidently enter the primary grades less ready to learn to read, and the difference between the two reading groups appears to increase at each grade level (p. 56)." The pervasiveness of reading failure, particularly among disadvantaged Negro boys, illustrates the inadequacies inherent in the current approaches used to develop early reading skills.

The following section reviews some of the salient characteristics of disadvantaged children which may suggest how they might best be taught to read.

Language Development of the Disadvantaged Child

The limited language development in standard English of disadvantaged children has its origin in the environmental milieu in which they live. Bernstein (1959) compared the linguistic patterns of the lower and middle class groups. In comparison to the middle class subjects, the language of the lower class group was informal, syntactically inferior, and focused primarily upon concrete needs and immediate circumstances. Irwin (1948) found significant differences in language maturity between infants of working class and white collar workers. The frequency of phonemes, the onset of true speech, and the rate of speech development all favored the white collar groups. Newton (1964) found that lower class children frequently mispronounced words, and used monosyllabic words, simple sentences, and sentence fragments. In general, the social and economic restrictions present in this setting offer the slum child meager experiences to develop the skills required to meet successfully the demands and expectations of the school (Goldberg, 1963). As an example, overcrowded living conditions result in a constant source of noise and confusion which can retard the child's ability to, and discriminate among, speech sounds. These same conditions promote an atmosphere of enforced silence and general non-communication with adult authority figures which leads to a progressive retardation of the child's language development. The scarcity in the home of school-related objects--especially of pencils, scribbling paper, books, puzzles, and toys--also has a debilitating effect. Thus, the school-related stimulation given to underprivileged children, as compared to middle-class children, is limited (Deutsch, 1963).

Reissman's description (1962) of the characteristics of the disadvantaged individual includes (1) deficiency in auditory attention and interpretation skills, (2) ineffective reading skills, and (3) a deficiency in general communication skills. Thus, the child not only lives in an environment that lacks the objects and experiences to stimulate his language development, but the individuals with whom he lives, and upon whom he models his behavior, further handicap language development because of their own language deficits (Mazurkiewicz, 1960; Ziller, 1964).

Thomas (1961) has indicated that the restricted vocabulary of young disadvantaged children is particularly illustrative of their meager language experience. In Black's (1965, p. 466) article on the characteristics of disadvantaged children, he quotes Figurel's findings that less than half of the words in the vocabulary of average preschool children are known by second grade children in slum areas. The finding that "common name words, such as sink, chimney, honey, beef, and sandwich" are learned by disadvantaged children one or two years later than by other children support Figurel's results (Black, 1965, p. 466).

Metfessel has drawn several conclusions about the causes and results of cultural deprivation (Black, 1965, pp. 466-67). First, disadvantaged children generally understand more English language than they use. Second, the speaking vocabulary and speech patterns used by disadvantaged children are not representative of the language used in school. Third, disadvantaged children are frequently handicapped in their language development because they often do not perceive that the same object may have more than one name. Fourth, disadvantaged children use less complex sentence structures in their speech patterns than do their middle-class counterparts. Finally,disadvantaged children appear to learn less from what they hear than do middle-class children.

The sum total of research and opinion suggests poignantly the deficit in language development of disadvantaged children which percipitates intellectual and academic retardation. Furthermore, unless this condition can be arrested through early school experiences, these deficiencies will get progressively worse.

Learning Characteristics of the Culturally Disadvantaged Child

In addition to a deficit in language development, the disadvantaged child exhibits certain other learning patterns and characteristics. Some of these patterns can be considered learning strengths upon which proponents of various teaching strategies may build. Other patterns or characteristics are to be considered learning weaknesses which proponents of various teaching strategies try to overcome. The following discussion of the learning strengths and needs of disadvantaged children is not exhaustive. However, the ones discussed are included because their apparent importance to the child's progress in many school-related tasks, especially the tasks associated with learning to read.

Learning Strengths. There appear to be two areas in which the disadvantaged child demonstrates relative learning strengths.

First, although the culturally disadvantaged learner has a more limited speaking and listening vocabulary than his middle-class peer, he is not non-verbal. To assume that he is non-verbal because of his relative paucity of verbal responsiveness in a formal classroom setting is to draw an erroneous conclusion (Olson & Larson, 1965, p. 262). On the contrary, Riessman (1963) notes that the "educationally deprived child can be quite articulate in conversation with his peers," while Crosby (1963) states that the disadvantaged child's natural language is often dynamic and that he is quite facile in its use. Thus, although the underprivileged child may be deficient in vocabulary and in the use of standard language patterns, he nevertheless has verbal ability. Therefore, with teaching strategies that provide verbal stimulation and offer guidance in the use of informal standard English, the culturally disadvantaged child can be expected to improve and expand his verbal abilities.

Second, disadvantaged children show relative learning strengths in visual and motor abilities. Weaver and Weaver (1967) studied the psycholinguistic profiles, as measured by the Illinois Test of Psycholinguistic Abilities, of three groups of preschool Negro disadvantaged children. For the combined samples, the subtest scores dealing with the auditory and vocal channels were significantly lower than those involving the visual and motor channels of communication. It could be inferred from this study that the teaching strategies which provide opportunities for these children to capitalize upon their ability to learn through visual and motor sense modalities would be most effective.

Learning Weaknesses. The learning weaknesses of the disadvantaged child entering first grade are numerous. The first of these to be discussed in this section is the child's poor self-concept in relation to school-related tasks.

Both Newton (1962) and Ziller (1964) indicate that early social models in the home affect the preschool orientation of the child toward one of the major school-related tasks: reading. "Acceptance of school-related tasks by the child," says Ziller (1964, p. 586), "probably depends on earlier social relationships and acceptance of self-orientation" modeled on the parents' interests and expectations. Newton (1962, p. 186) suggests that "when the learner 'translates' the expectations of the adult models into self-goals . . . (he) derives a functional level of aspiration." Where there is "apathy as well as emotional and social maladjustment among parents," Della-Dora (1962, p. 468) concludes that "student self-concept and level of aspiration are generally low in relation to typical school centered activities." Since apathy and emotional and social maladjustment are characteristic of low socio-economic groups (Harrington, 1962; Hines, 1964; Humphrey, 1964; Myrdal, 1962), it is not surprising that the children of these groups "have characteristically low self-concepts which in turn adversely influence (their) school achievement (Krugman, 1961, p. 24)".

A second learning weakness of the disadvantaged child is his lack of articulate communication in Standard English in the formal classroom setting. Olson and Larson (1965) and Reissman (1963) report that underprivileged children are frequently unresponsive and seemingly inarticulate in the classroom, in contrast to the facile communication they evidenced within their peer group. Crosby (1963, p. 302) notes that this unresponsiveness may result because a child finds his "natural vocabulary fails to communicate," in the classroom setting, and "he resolves his problem . . . by becoming quiet". Or, as Sharp (1963, p. 306) postulates, the child may come to school "mute and unresponsive because from infancy his parents have demanded that he keep silent and out of sight". In either case, teaching strategies should be used that recognize the probable cause of the disadvantaged child's unresponsiveness, and provide classroom situations that will encourage the child to communicate without fear of failure.

A third learning weakness clearly associated with young disadvantaged children is their inadequate ability to discriminate among speech sounds (Mueller & Weaver, 1964; Smith, 1962). Deutsch (1963) and Deutsch (1964) found through experimentation that disadvantaged children have inferior auditory discrimination for speech sounds. Harris and Serwer (1965) report that analysis of pretest results of approximately 1,100 disadvantaged children entering first grade showed that the group's mean score on a phonemes test fell at the first percentile of the national norms. Durrell and Murphy (1953), Harris (1963), and Smith (1963) indicate that ability to discriminate among speech sounds is basic to progress in reading instruction. Christine and Christine (1964) showed that inability to discriminate speech sounds is related to reading retardation. Templin (1957) found low socio-economic status pupils (CA 6 to 8) significantly inferior on tests of auditory discrimination when compared to children of higher social status. Clark and Richards (1966) found preschool deprived children made significantly more errors than a group of non-deprived children on the Wepman Auditory Discrimination Test. Buktenica (1966) found first grade disadvantaged children significantly inferior to middle class subjects on verbal and non-verbal tests of auditory discrimination. In the light of the above results, it is imperative that strategies of teaching reading to the underprivileged child make ample provision for the early strengthening of discrimination to speech sounds early in the program.

A fourth learning weakness of the disadvantaged child is his failure to develop a pattern of attitudes toward achievement characteristic of his middle-class peers (Gray, 1962). While no one set of social patterns may be justified as being inherently superior to another, it appears desirable for the disadvantaged child to acquire these motivational patterns so as to compete on even social and economic terms in our middle-class oriented society (Humphrey, 1964, Chapter 9). Terrell, Durkin, and Wiesley (1959, p. 270) report that emphasis on achieving excellence in academic performance, of "learning for learning's sake," is less characteristic of children from lower class than from middle-class environments. Crosby (1963) and Reissman (1962) state that this view of learning is, in fact, the antithesis of the view of learning held by the disadvantaged child, who, like the adults in his culture, is motivated by the immediate "use value" of a given task. The type of teaching strategies to employ with the disadvantaged child should be aimed at helping him develop attitudes toward achievement characteristic of his middle-class peers. Strategies which are discussed in the professional literature appear to emphasize one or the other of two points of view. The first viewpoint is characterized by an emphasis on teaching strategies in which the learner is given rewards in the form of concrete treats and social recognition by the teacher (Klaus & Gray, 1963). Since the culturally disadvantaged child generally lacks the middle-class child's preschool orientation for expecting a reward for performance, especially for task completion (Deutsch, 1963), the assumption is made that he can best be expected to acquire this motivational pattern for beginning and completing a task if he is provided with a teaching strategy in which rewards are employed. In contrast, proponents of teaching strategies represented by the second point of view stress the development of the middle-class motivational patterns through a de-emphasis on teacher-given rewards. Taba (1964, pp. 137-58) states that "research on motivational patterns suggests the futility of emphasis on external rewards" and emphasizes the need for "stressing the kindling of curiosity and the opportunities for experiencing one's power over the materials". Ausubel (1963) in his discussion of a teaching strategy for deprived pupils makes the following judgments concerning the basis for motivating the learning of these disadvantaged children:

> The development of cognitive drive or of intrinsic motivation for learning, that is the acquisition of knowledge as an end in itself or for its own sake, is, in my opinion, the most promising motivational strategy which we can adopt in relation to the culturally deprived child (p. 459).

It is unclear at present whether teaching strategies based on one or the other of these two viewpoints would be the most appropriate for helping the disadvantaged child develop the motivational patterns and attitudes toward achievement characteristic of his middle-class peers. However, by employing teaching strategies which focus on one or the other of these two points-of-view, it may be hypothesized that the school may be able to determine whether one is more appropriate than the other for meeting this learning need of the disadvantaged child.

A fifth learning weakness of the young disadvantaged child is the development of persistence for task completion. Gray (1962, p. 31) acknowledges that evidence relating to persistence is not clear-cut, but she states that "the review of studies of persistence by Feather (1962) seems to indicate that persistence may be specific to a given task rather than to a general trait, at least at early ages". Since lack of persistence is not identifiable as a basic personality trait in the young learner, but appears to be task-related, we may expect this deficiency to be improved by planning school-related tasks that demand persistence to task completion.

Background on Teaching Reading to Disadvantaged Children

The professional literature on teaching beginning reading is extensive. This is true both generally in teaching children across the full spectrum of intellect and social class, and specifically with regard to the disadvantaged. In the past, beginning reading instruction has been characterized by cyclical fads based on philosophical predispositions of the times. Now, more and more, scientific evidence is becoming available upon which to build programs of instruction generally, and specific to the disadvantaged.

Phonetic as Look-and-say Approaches

Few aspects of the elementary school curriculum have evoked as much acrimonious debate as the issue over what constitutes the most efficacious method to develop early reading skills. The protagonists of the debate have usually championed the efficacy of either: 1) the "look-and-say," or 2) the phonic method. Under the "look-and-say" (or analytic) reading approach instruction is initiated by introducing words or "wholes" as units of meaning (Russell & Fea, 1963). Later, the child learns to analyze these words into their constituent auditory and visual elements. In contrast, the "phonic" (or synthetic) approach to beginning reading is based upon the premise that children should be taught to read by learning to recognize the individual auditory and visual components of words. In this instructional orientation, children first learn the common letter-sound associations and are taught later to synthesize these units into words (Bliesmer & Yarborough, 1965).

While there has been a recent increase in the use of the synthetic method, the analytic emphasis is still the predominant approach to early reading instruction. During the 1950's, surveys covering a large number of states and local school districts found that approximately 90 percent of extant reading instruction employed predominately an analytic, or sight-word approach (Staiger, 1958; Stewart, 1957). However, most of the current approaches to teaching reading include substantial components of both the sight-word and phonic approaches (Chall, 1967).

A number of studies have compared the efficacy of the sight-word and the phonic approaches to initial reading instruction. Chall (1967) found that most of the studies which compared the "look-and-say" and phonic method were conducted before, or during the 1930's. In an analysis of nine studies, Chall (1967) concluded that the children taught phonics were superior to those under the sight-word approach in both word recognition skills and oral reading. The findings on the factors of reading rate and comprehension were less conclusive.

Most of the research on methods of teaching initial reading skills after 1930 compared programs employing varying degrees of phonic instruction (Russell & Fea, 1963). In recent studies (Bear, 1964; Bliesmer & Yarborough, 1965; Henderson, 1955), the phonic approach, in comparison to right-vocabulary oriented methods, led to superior reading achievement in the first grade. In the Bear (1964) and Henderson (1955) studies, the synthetic groups maintained their superiority even at higher grade levels. Gurren and Hughes (1965) reviewed the results of 22 studies which contrasted reading programs containing either gradual or intensive phonics instruction. The intensive phonics programs resulted in superior reading achievement in 19 out of 22 comparisons. None of the comparisons favored the gradual phonics groups. Further evidence for the value of systematic phonics is provided by Chall (1967). After reviewing 25 studies, Chall (1967) concluded that "systematic phonics at the very beginning tends to produce generally better reading and spelling achievement . . ., at least through grade 3 (p. 114)."

The value of phonics instruction is given additional support by the results of the U. S. Office of Education first grade studies on reading instruction. Bond and Dykstra (1967) concluded, from an analysis of four studies, that a basal reading program supplemented with training in phonics was superior to the use of just basal method materials alone.

The results of some studies have perpetuated the notion that phonics instruction is less effective for children of lower mental ability (Anderson & Dearborn, 1952; Dolch & Bloomster, 1937; Garrison & Heard, 1931). More recent findings, however, appear to refute this widely-held assumption. Naeslund (1955), cited by Harris (1961), conducted a study in Sweden which compared synthetic and analytic methods of teaching reading to pairs of twins. While no significant differences between methods emerged for children of normal or superior ability, the synthetic method resulted in superior achievement for children of lower mental ability. The results of a number of other studies appear to support Naeslund's findings (Chall, 1967; Gurren & Hughes, 1965).

In light of this evidence suggesting the relative superiority of the phonetic approach, all three experimental approaches to beginning reading in this study, our Cooperative Reading Project, were phonetic in nature. We were further influenced in selecting only analytic approaches by the observed characteristics of our inner-city, largely-Negro, underprivileged children. These particular slum children of the South bring to the schools an especially restricted and non-standard form of oral language which is incompatible with existing instructional procedures. Generally, they neither hear nor articulate the ending speech sounds. In addition, many of their teachers have been brought up in this same culture and, therefore, often have similar problems in using the forty odd sounds of Standard English. Therefore, it is not surprising that these children, in contrast with middle-class youngsters, have demonstrated progressive retardation in school. To correct this, it seemed to us, especially necessary that phonetic approaches to beginning reading be employed. The sight-vocabulary approach is based on the belief that children should be first taught whole words, and later through various analytic techniques, the recognition of letters and sounds that they represent. The assumptions for this type of program are that: (1) the youngster has had a rich oral language experience background, thus assuring that the vocabulary introduced in the first year reading materials is known, and used, by the youngster in listening and speaking; (2) since he is already familiar with the words used in reading, the child will more readily learn to recognize the graphic representations of those words when they are presented in a carefully-controlled manner; and (3) when the child has mastered a minimum sight vocabulary, he is then ready to be introduced gradually to word analysis where perception of details in word construction, and the relationship of the whole to its parts, is examined (Heilman, 1961). It would seem that underprivileged children--especially in the South--do not have the necessary aptitudes to begin reading in this manner.

Our three experimental reading programs are described under treatment on pages 23 to 25. Below is summarized the research evidence on ITA, WIC, and the Hay-Wingo phonic drills.

Research on the Initial Teaching Alphabet

The first British experiment comparing ITA with TO began in 1961 and terminated with the 1967 report (Downing, 1967). In this original field testing, approximately 2,500 four and five year old British subjects were divided into ITA and traditional orthography groups. The popular, sight-approach, Janet and John Readers were used by both. Experimental teachers attended refresher courses in traditional orthography. Three main conclusions are drawn in the final report: (1) ITA produced superior results in reading and spelling over TO, and (2) the success of ITA occurred in spite of an important setback in basic reading skills at the transition stage from ITA to TO. This first study was criticized severely because the teacher variable was not controlled. Thus Downing and Jones (1966) embarked upon the second British investigation, utilizing 1,100 four and five year old British children who were assigned randomly to ITA and traditional orthography groups. Thirteen schools were involved, each one having both ITA and traditional orthography treatments. Again the Janet and John Readers were used. Whereas the first experiment had different teachers using ITA versus TO, in this second experiment the same teacher taught both ITA and TO classes in the same school, spending half her time in the ITA room and the other half in the TO room. In this second experiment more rigorous control was also made over publicity and the visitor variable. Results of the second experiment differ from those of the first:

(1) the learning seems to have been slower, (2) transition occurred later, and (3) the differences between ITA and TO achievement were generally not so great as in the first experiment. Nevertheless, the results of the second experiment support the conclusion that the ITA students were superior to the TO students in reading achievement, even though they too had a setback at the transition stage (Downing and Jones 1966).

The first extensive experimental field-testing of ITA in the United States was conducted by Mazurkiewicz (1966) at Bethlehem, Pennsylvania. In this case, an experimental version of the Early-to-Read i/t/a series developed by Mazurkiewicz and Tanyzer, utilizing the phonetic rather than the sight vocabulary approach, was used. As in the British experiment, the Bethlehem study indicates the superiority of the ITA group not only in reading, but in spelling and in story writing.

Tanyzer, et al. (1965) conducted a study comparing three different approaches to beginning reading, namely the Lippincott Basic Reading Series, the Early-to-Read i/t/a series, and the Scott Foresman Basal Readers in TO. The study was conducted on 643 first grade children in 17 schools in Long Island, New York. The Lippincott and ITA groups produced the best results regardless of IQ. Results indicated that both of these groups were comparable on all measures and significantly superior to the Scott Foresman pupils on most of the reading and spelling tests. No significant differences between boys and girls occurred among any of the systems. (Descriptive statistics suggested that the Lippincott group was advanced over the ITA group.)

Hahn (1965) compared an ITA, language arts in TO, and basic reader approach in TO with first grade children. The ITA group used the Downing Readers which are look-and-say oriented. The ITA and language arts groups had significantly higher scores than the basal reading group on word reading tests and on spelling.

Hayes and Wuest (1967) compared: (1) the Scott Foresman Basal Reader Program, (2) the phonetic Basal Readers program published by Lippincott, (3) an eclectic combination of the Scott-Foresman materials plus phonic drills, and (4) a language arts approach, using the Initial Teaching Alphabet materials published by i/t/a Publications which also publishes the Mazurkiewicz-Tanyzer Early-To-Read series. At the end of the third grade, the Lippincott program produced the best overall results on a standardized silent reading achievement test, while the ITA program was superior on a standardized oral reading achievement test. In a follow-up study, there was no difference between the Lippincott and ITA groups on oral reading, but again the Lippincott group was significantly higher on word meaning scores. (The Lippincott program appeared to be especially effective with the high IQ children.)

Fry (1965) compared: (1) ITA, (2) basal readers using a diacritical marking system, and (3) a basal reading text in traditional orthography. All three groups were considered experimental since all three approaches were new to the school system and to each teacher. Volunteer teachers were assigned randomly to each treatment. All three groups had equal supervision for the 140 days of the experiment. The ITA group used the Early-to-Read series, the traditional orthography group used the Sheldon Readers, and the diacritical marking system group used the Sheldon Readers modified with diacritical marks superimposed on the word along with special exercises to introduce diacritical marks. No significant differences were found among the three treatment groups, silent or oral reading. There was no method better for boys versus girls, or for younger versus older children. Variation between classrooms was greater than variations among methods. The ITA groups spelled more poorly than the other groups when traditional orthography was used.

McCracken (1967) compared the Early-to-Read series with the Ginn Basal Reading Series in teaching beginning reading to 34 children in an experimental ITA class and 26 children in a control group. At the end of the second year, there was no significant difference between the ITA and the TO group on the reading subtest of the Stanford Achievement Test. Furthermore, no significant difference was found between the groups on Gray's Oral Reading Test. However, the ITA children consistently attempted more paragraphs per story when reading from Gray's Oral Reading Test even though they did not read better, suggesting a greater degree of independence and tolerance for frustration.

Dunn et al. (1968) initiated in 1964 the Cooperative Language Development Project to test the efficacy of the Early-to-Read i/t/a series plus the Peabody Language Development Kits in stimulating inter-city disadvantaged children of the South in the primary grades. The following are the results after the children had completed their third grade. On the Metropolitan Achievement Test, children utilizing ITA were significantly advanced in written language achievement over those taught to read through the conventional basal reading program in traditional orthography. Furthermore, the PLDK lessons enhanced school achievement significantly, especially for the ITA children. On the Illinois Test of Psycholinguistic Abilities, language age gains of the PLDK subjects were significantly greater than those obtained by the non-PLDK subjects, with a tendency for the combined ITA and PLDK treatments to be particularly facilitating. As measured by the Peabody Picture Vocabulary Test, no significant differences in hearing vocabulary were found among the PLDK groups, suggesting that the PLDK lessons have little effect on this aspect of language. Finally, the PLDK lessons enhance IQ gains scores on the 1960 Stanford Binet, particularly for children in both ITA plus PLDK. In a follow-up study of children after they had completed the fourth grade, overall, the ITA approach to teaching beginning reading no longer resulted in superior achievement in a written language of the children when compared to the performance of pupils who had been taught by conventional basal reading program in TO. The ITA approach was superior to the TO approach on MAT achievement when it was combined with two or three years of PLDK exercises. Three years of PLDK exercises is significantly superior to no, one, and two years of such lessons, suggesting that only an extended program of oral language stimulation produces effects that continue into a follow-up year. Finally, in terms of the ability to write and tell stories from a picture, on both the written and oral language tests, the PLDK lessons did not lead to any appreciable improvement in productivity scores. On the written language test, children with two and three years of PLDK experiences obtained significantly higher scores on correctness or syntax. Apparently, training from the PLDK lessons generalized to the proper usage of words, punctuation, as well as the formation of words. Oral language stimulation lessons enhanced the development of meaning or degree of abstraction as reflected by performance on both the oral and written language tests. Finally, there was generally no significant difference in the ability to write and tell stories from a picture between the ITA versus the TO groups.

In summary, the studies reviewed above suggest the effectiveness of ITA at the early stages of reading. However, even here the result of studies are equivocal. Nevertheless, generally, the studies provide a heartening support for the ITA approach, though the long-term advantages or disadvantages of using ITA is far from evident. Most of the experiments, including the Cooperative Language Development Project, tend to have the Hawthorn effect operating with the ITA teacher being involved in a novel approach, getting more recognition, perhaps having additional stimulation, materials, etc. at their disposal. Too,these studies have been conducted in local school systems, which could not possibly provide the rigidity of laboratory studies. Thus, it has been difficult to control for the teacher variable. The remarkable advantage of the second British study is that the same teachers taught the TO and the ITA groups. The fact that the results were not as dramatic as in the first study, may have in part been due to the teacher selection process, for certainly the novelty had worn off by the time of the second experiment. In any event, the evidence is far from clear and consistent that ITA is superior in teaching beginning reading to children generally, or to Southern children of the inter-city. Very clearly, in the Cooperative Language Development Project, a Hawthorn effect and probably the teacher selection factor were both operating to contribute to the success of the experimental treatment.

Research on the Words-in-Color Approach

Little in the way of systematic or sophisticated research has been conducted on the effectiveness of WIC. Essentially all of the articles in the literature are descriptive in nature. Words-in-Color is a rather recent development which is still not in very wide use throughout the United States. Demonstration projects were first begun in 1959. By 1963 a number of school systems in Ohio were trying out the Words-in-Color program. Since then a number of school systems in California, New York, Massachusetts, Maryland, and Texas have experimented with this approach. Probably due in large measure to the newness of Words-in-Color, there is little in the literature to suggest conditions under which it may be effective.

Bentley (1966) reported Words-in-Color being used in two first grade classes in an Ohio school district, and stated that children using Words-in-Color did well on the Stanford First Grade Reading Test. He also reported that it was enthusiastically received in a class for slow learning children (educable mentally retarded). Too, it was used successfully in Cleveland, Ohio with illiterate adults.

Hinnan (1964) reported on the effectiveness of WIC with a classroom of 32 first graders. By the end of the year, 18 of the children were reading between the third and six grade level, several reading at the second grade level, and all the others were reading first grade materials easily.

Bailey (1966) has completed the only reasonably sophisticated study involving the Words-in-Color as part of her doctoral dissertation here at Peabody, and as part of this very Cooperative Reading Project. For her dissertation, she compared the Words-in-Color approach with the supplemented reading approach reported in this monograph, with and without PLDK. When she wrote her study up, after the first year of this Cooperative Reading Project, there was no significant difference between the group receiving WIC instruction and the group using the supplemented basal reader approach. However, when Words-in-Color was combined with the oral language stimulation program provided by PLDK, the gain in reading exceeded those of the other groups. On the basis of these findings, Bailey reached a conclusion that neither reading approach could be thought of as superior to the other.

It is evident that the research literature is not extensive or intensive enough at this point to provide any support for the claims that Words-in-Color is superior in teaching children beginning reading. As with ITA, the involvement of the teachers in a novel approach and their resulting enthusiasm have been important factors in contributing to the success of Words-in-Color programs as seen by the subjective evaluations of those interested in this method. Nevertheless, there did seem to be enough suggestion about the virtue of Words-in-Color to justify its inclusion in the Cooperative Reading Project.

Research with Hay-Wingo Phonic Drills

Only one study is available that closely parallels what was done in this Cooperative Reading Project. This longitudinal study was conducted by Bear (1964), beginning in September 1956. Seven first-grade classes constituted the experimental group, and another seven classes the control group. Both groups used the basal reading series by Row-Peterson. In the case of the experimental group, the basal readers were supplemented by the 1954 edition of Reading with Phonics, published by Lippincott and popularly known as the Hay-Wingo System. One hundred and thirty-six first grade children were in the experimental group and 139 in the control group. At the end of the first grade, the pupils who received intensive phonetic drills scored significantly higher on both the Gates Primary Reading Test and the Metropolitan Achievement Test, as compared with control groups which were introduced gradually to phonics in the Row-Peterson Series. Bear concluded that the phonetic drills could be used successfully along with the basal reader program and would serve as a valuable supplement in developing reading skills. In 1959, Bear followed up these same pupils after they had completed their sixth grade. Overall, no differences persisted between the experimental and control groups on the Gates Reading Survey except in the area of vocabulary where the experimental group was significantly advanced. Furthermore, in a breakdown of the upper 25 percent of the subjects in terms of intelligence, as compared to the middle 50 percent of the group, in contrast with the lower 25 percent of the group, no differences were found between experimental and control groups in the slow and rapid learners groups. However, in the middle 50 percent group, the experimental group tended to be superior to the controls. On the basis of the follow-up study, Bear concluded that progress in improving reading programs is likely to be retarded unless educators try to compromise the two extreme positions taken by the adherent of the phonics versus the look-and-say approach. Proponents of the synthetic methods should refrain from developing reading programs that place undue stress on phonics to the neglect of other important skills in reading. Similarly, authors of basal reading programs should recognize that phonics would appear to be a valuable aid to beginning reading.

This one study provides some evidence that the Hay-Wingo may be used effectively as a supplement to basal readers. It was, therefore, incorporated into this present Cooperative Reading Study.

Some Concluding Observations on the Research Literature

In recent years there has been impressive volumes of more sophisticated research comparing the relative effectiveness of various methods of teaching reading. Improved statistical design, the use of inferential statistics, attempts to control or be aware of the teacher variable, and the Hawthorne effect have all helped provide the field with data on which to make judgement on how to teach what child by what method. Nevertheless, the milieu in which these studies have been conducted have been the public schools where the prime commitment is to the education of children. Thus, it has not been possible to conduct these studies with anything approaching rigorous laboratory controls. For example, in our Cooperative Language Development Project the rather glowing picture of the effectiveness of ITA may be due to any number of factors, including the possibility that ITA is superior to a basal reading program, especially for Southern disadvantaged children who neither hear nor speak all of the standard forty-odd sounds of English. However, it is equally probable that our results may have been due to a confounding of the teacher variable plus the Hawthorne effect. It was not possible to assign teachers randomly to experimental and control treatments. Instead, schools were assigned to one treatment or the other, largely based on the recommendation of the central office staff of the school system who probably had a tendency to assign the better schools, the better and more cooperative principals, and perhaps even the better teachers to the experimental treatments.

Furthermore, in our Cooperative Language Development Project motivation to excellence among the experimental teachers was extremely high, whereas no incentives were provided to the control teachers. Experimental teachers were provided with a small supplementary stipend and were asked to attend in-service training sessions throughout the year, approximately one every two or three weeks. They were provided with supplementary materials and were frequently visited by researchers, school officials, and others. Too, they were given considerable recognition by their principals. Furthermore, the experimental teachers had an opportunity to teach in teams, to observe each other teach, and to share ideas. They were visited regularly by a supervisor. In contrast the control teachers were not stimulated or supported in any way. Their children were simply tested at the beginning of the experiment and retested at the end of each school year thereafter. Thus, a very important part of the experimental treatment were the added incentives provided the experimental teachers and not the control teachers.

For these reasons, the staff embarked upon this second study known as the Cooperative Reading Project. In this particular case, we had three experimental reading treatments, and had equal stimulation for each of the experimental groups of teachers. In addition, we had our typical control group, who were not given additional stimulation. However, the same teachers did not teach all three approaches. In fact, in this case the bias may have been operating against ITA. Generally, new schools were identified to utilize the Words-in-Color approach and the supplemented basal reading approach. But we returned to the same schools for our experimental ITA teachers. There is some possibility that the first cadre of teachers in the school,who were initially selected for the Cooperative Language Development Project,may have had skills that surpassed those in the second echelon who were selected to teach ITA in the Cooperative Reading Project. Furthermore, by this time the enthusiasm and novelty of the ITA approach had fallen off in these schools as far as the principals were concerned. In addition, the central office staff who were responsible for ITA had probably lost some of their vigor and drive in this second experiment. Thus, a major intellectual exercise remains to interpret the results of research in reading without bias and most parsimoniously. While the investigators themselves discuss and interpret their results, the reader has an equal responsibility to add in his own interpretations of what factors may have contributed to the results.

CHAPTER II

METHOD

This chapter discusses, in more detail, the research method employed in the Cooperative Reading Project. It includes information concerning the setting, subjects, treatments, classroom procedures, teachers, and evaluation instruments.

Setting

The Cooperative Reading Project was conducted in schools which draw their pupils from lower socioeconomic areas of the Nashville-Davidson County Metropolitan School System. In these areas, the majority of the families are considered underprivileged, socially and economically, according to any standard. They are under-employed and ill-educated. Their children are more or less underfed and poorly clothed. Nashville-Davidson County, like any other metropolis, has a growing problem of slums and ghettoes. It has a school system of more than 100 elementary and secondary schools, enrolling about 100,000 children and youth. The schools are integrated, but in practice many remain segregated due largely to housing patterns. Approximately one-third of the schools involved in the Cooperative Reading Project were undergoing a dramatic shift in racial balance. They were moving from a majority of Caucasian to a majority of Negro students. Furthermore, many of the schools in the project area were overcrowded.

Although it was recognized that not all children enrolled in any given school located in a slum area could be described as disadvantaged, the nature of the project required that the experimental treatment be given to entire classrooms. Administrative personnel of the Metro Schools were asked to select those schools in which the large majority of children would be classified as disadvantaged. On the basis of these selections, 12 public elementary schools were asked to participate in the project. Nine of these schools were involved in the experimental treatment programs, three for each of the experimental reading treatments. The other three schools were selected to provide control subjects for the study.

In assigning reading treatments to the experimental schools, considerations were given to the size of the schools, the degree of racial integration, and also other aspects of school environment, so as to counterbalance the effects of these variables. The ITA treatments were given at the same schools which provided ITA instruction for the earlier Cooperative Language Development Project. Nine first grade classes were selected for each of the three reading treatment groups. This made a total of 27 experimental classes, and provided about 750 experimental subjects. About 150 first grade children were drawn from 12 first grade classes in the three control schools. This gave a total group of about 900 first grade children involved at the outset of the project.

Subjects

Unfortunately, several factors acted to reduce the size of the experimental sample. Due to limitations in terms of time and professional manpower, the project staff was able to obtain complete pretreatment psychometric test data on only 838 subjects, 712 in the experimental classes and 126 in the control classes. This constituted the original subject pool or sample size. This sample pool was reduced, during the two-year treatment period, due to children being transferred out of experimental schools, and, at the end of the school year, due to their not being available for posttesting. This left a total sample of about 538 subjects--473 in the combined experimental groups and 65 in the control groups--which constituted the final subject pool. Tables 1A and 1B in Appendix A contain complete reference data (CA, IQ, LA, etc.) by treatment group for the final sample pool. Examination of this table reveals that, at the outset of the experiment, the subjects in the final sample pool had a mean IQ of 88, 12 points below the national norm. Their initial language age was five years and three months; this was about one year below the average for their CA. The mean IQs and LAs for the final sample pool did not differ appreciably from the averages of the original subject pool (IQ = 87; LA = 5 yrs., 2 mos.). (The pretest data on the sample of children in the second-year analysis may be found in Table 3.)

Basic socioeconomic information, including the educational level of the best educated parent, housing conditions, and income level was obtained by ratings on the Peabody Cultural Opportunity Scale. These data confirmed that the project children came from disadvantaged backgrounds (see Table 1). Their families fell at the lower end of the socioeconomic continuum. On the average, the best educated parent of these children had about 11 years of schooling. The average number of persons per family was 6.76, which was larger than the national average of two parents and two to three children. The housing conditions of these families appear somewhat better than expected. This was due to the many new city housing and urban renewal projects that have been constructed in the inner city of Nashville. Homes in the housing projects were rated as fair. However, 30 percent of the families still lived in a house or in an apartment rated as extremely, or moderately, poor.

The total family incomes of the project children give a better indication of their socioeconomic status. Forty-two percent of these families earned an annual income of less than \$3,000. Forty-six percent earned between \$3,000 and \$6,000 annually. Only 12 percent earned more than \$6,000 per year. The main wage earners of these

Table 1

Basic Home and Family Information on the Final Sample Pool

Group	Percentage of Negro Race	Percentage of Families on Welfare	Average No. of Persons per Family	Mean Educ. Level of Parent*	Housing Conditions in Percentage				Income Level in Percentage			
					extremely poor	moderately poor	fair[1]	good	less than $3000	$3000-5999	$6000-8999	over $9000
ITA only	84	5	6.24	11.43	-	13	71	16	35	62	-	3
ITA/ 1 yr. PLDK	67	6	6.34	9.93	5	16	79	-	64	33	3	-
ITA/2 yrs. PLDK	98	5	6.85	11.00	8	5	59	28	40	50	5	5
WIC only	100	5	7.72	11.15	10	30	35	25	40	38	19	3
WIC/1 yr. PLDK	94	19	6.19	10.30	3	13	77	7	46	50	4	-
WIC/2 yrs. PLDK	95	18	6.59	10.56	21	5	59	15	60	30	5	5
SCRP only	87	11	7.11	11.18	7	45	26	22	31	54	15	-
SCRP/1 yr. PLDK	96	4	6.25	10.46	14	25	39	22	32	57	11	-
SCRP/2 yrs. PLDK	86	6	6.74	11.09	18	35	35	12	21	47	26	6
Control	88	22	7.15	10.78	17	15	59	9	48	46	4	2
Total	89	11	6.76	10.81	11	19	55	15	42	46	9	3

*Educational level by of the best educated parent by self report.

[1] Most of the Federal Housing Project families were classified as in fair housing; many of the lowest income level families lived in these housing projects.

families were employed mostly as household,personal, maintenance, community service workers, day laborers, or semi-skilled laborers. A few were employed as skilled laborers, clerical, and salesworkers. Very few of the occupations fell in the professional, technical, and managerial ranks (for details concerning the classification of occupations used in this project, see Appendix B). (In an earlier survey of the original subject pool for this study, Mercer (1967) found that 14 percent of these families were receiving welfare assistance.) In the project sample, 11 percent were on welfare assistance rolls.

On the basis of socioeconomic status information, children were deleted from the final evaluation who came from families that: 1) the total family income was over $9,000, 2) lived in a very good house or apartment, 3) lived in a good house or apartment, and the total family income was over $6,000, 4) the main wage earner was employed as a professional, technical, or a managerial worker, or 5) the best educated parent had four or more years of college training.

Treatments

The following is a description of each of the reading and the oral language program.

Initital Teaching Alphabet

The Early-to-Read Series developed by Mazurkiewicz and Tanyzer (1963) was used in the experiment. This series consists of eight textbooks and five workbooks designed to take the child from the beginning reading level through the transition to traditional orthography (TO) at the high third grade level. The ITA, devised by Sir James Pitman in England, has 44 symbols instead of the 26 symbols in TO. Twenty-four of the symbols are the traditional ones, while 14 are new. Each of the ITA symbols represents one phoneme, thus furnishing consistency between the sound-symbol relationship. Only the lower-case form of characters are used, with capitalization being achieved by using larger versions of the lower-case letters.

The Mazurkiewicz and Tanyzer program is based on the premise that children should first learn the individual sound-symbol relationships before they are taught to synthesize them into words. Therefore, in the beginning stages of the program, the sounds and their corresponding symbols are learned in isolation and in key words.. When a few of the sound symbols are learned, the child is taught to synthesize them into simple words. Once the 44 symbols are associated with their sounds, the child develops the concept of blending the sounds into larger words. Thus, he should be able to read (decode) any word.

The last two textbooks in the series (#7 and #8) are designed to make the transition from ITA to TO. When the transition was completed, the children in the experiment moved into Book 2 of the Basic Reading Series by McCracken and Walcutt, published by J. B. Lippincott Company. This program has a systematic phonic approach which was developed from the same rationale as the Reading with Phonics program and appeared to be especially appropriate as a follow-up for the i/t/a Early-to-Read Series.

Words in Color

The Words in Color program (Gattegno, 1963) is organized around a phonetic analysis of the English language as it is spoken. It utilizes color to facilitate the learning and recognition of the basic speech sounds used in reading. Under this system, each of the 47 speech sounds of English identified by Gattegno is expressed with a specific color. Individual letters (or groups of letters) are colored according to how they sound in a given word. For example, the underlined portion of the following words would appear in the same color because they all represent the same sound: late, way, waite, they, and straight. In contrast, the underlined portion of the following words would be in a different color because, although the spelling is identical, each word represents a different speech sound: thought, though, bough, and through.

The short sounds of the vowels are introduced first using colored chalk at the chalkboard. From the very beginning, the program stresses that the learner takes over the responsibility of producing the sounds associated with the signs. Until the pupils can vocalize the oral model accurately, the teacher is urged to give the auditory model, accompanied by the visual model. Thereafter, the teacher supplies the visual model and the pupils vocalize its speech equivalent. The modeling is usually done with only one or two of the short vowels. Then the teacher gives the children the opportunity to produce the remaining vowel-consonant combinations without vocal prompting. The WIC materials consist of colored phonic code wall charts, colored word building wall charts, worksheets, a word building book, three pupil books, color-keyed word cards, and a book of stories.

This program is basically designed to build word attack skills. It is supposed to be completed within a relatively short period of time, usually 12 weeks, with average and above average children. This initial period is then followed by any basal reading program. During the first year of the treatment, the WIC teachers did not formally go into a specific basal reading program. However, during the Spring, several levels of the Basic Reading Series by McCracken and Walcutt were placed in their rooms as supplementary materials. This reading series was continued into the second year.

Supplemented Conventional Reading Program

The Supplemented Conventional Reading Program (SCRP) used a basal reading series supplemented by a phonics program. The basal program was the Reading for Meaning series by McKee, Harrison, McCowen, and Lehr (1963), published by Houghton Mifflin. This program was supplemented by the Reading with Phonics program, published by Lippincott and known as the Hay and Wingo phonic drills (1960).

The Houghton Mifflin Basal Reading Series is based on the premise that the typical English-speaking child brings to school a sizable speaking vocabulary, and that the major problem he encounters in beginning reading is finding a way to convert a printed word into its familiar spoken form. To accomplish this, a single technique is employed for unlocking new words. This consists of using both the context of the sentence and the beginning sound of the word. Later in the program some ending and middle sounds are used. At the pre-reading level, 18 single (one letter) consonants and 4 digraphs (sh, wh, th, ch) are taught. The other consonants and the vowels, plus common endings and other syllables, are taught as they are needed. The basic vocabulary is carefully controlled. As new words are introduced, the teacher helps the children learn them by using the program's basic word-attack technique. The teacher's guides which accompany each of the readers furnish: 1) detailed lesson plans, 2) suggestions for meeting the needs of fast and slow learners, and 3) suggestions for the use of numerous supplementary materials produced as a part of the program.

Reading with Phonics, by Hay and Wingo, is not a basic reading program, but is a skills program designed to make the child independent in word recognition. It makes the assumption, as does the Reading for Meaning program, that first grade children already have a large speaking vocabulary and, therefore, they need a word recognition program. The materials consist of one textbook and three workbooks. The phonetic elements are learned through the auditory, visual, and kinesthetic senses. The children are first taught to listen for a sound, and then to associate the sound and its visual symbol. Kinesthetic development takes place in the correct movement of the tongue and eyes, and the development of hand and arm through writing (Hay & Wingo, 1960).

Language Stimulation

The oral language stimulation was furnished, during the first year of the experiment, through the use of the Peabody Language Development Kit (PLDK), Level #1, (Dunn & Smith, 1965). During the second year, Level #2 of the PLDK was used (Dunn & Smith, 1966). The commercial versions of both Levels #1 and #2 were used. This program was taught daily to the whole class in 30 minute lessons. The PLDK is designed to stimulate oral language and verbal intelligence by training the processes of reception, expression, and conceptualization. Reception is provided through the three modalities of sight, hearing, and touch. Expression is provided through both the vocal and motor channels. The lessons concentrate on the development of verbal intelligence, focusing upon divergent, convergent, and associative thinking. They are designed for children functioning intellectually between the four and one-half to the eight year age levels.

There are a total of 23 different types of activities in the PLDK. Representative of these are brainstorming, classification, conversation, critical thinking, describing, imagination, listening, memory, pantomine, relationship, story, and vocabulary building time. Each kit contains 180 daily lessons. The lessons include from two to four activities selected from the 23 categories. Emphasis is placed on sequencing the difficulty of the activities from the beginning to the end of the school year.

Even though teacher participation is inevitable, the overall goal of the PLDK is to allow maximum participation by the children, giving them an opportunity to talk, think, and learn effectively in a situation with less formal structure than a regular academic period. Language time is designed to provide a period where all the children can participate and feel that they are successful. Teachers are encouraged to use much positive reinforcement, to vary activities, and to involve all children. No reading or writing is required.

Summary of Treatments

The description of the three reading programs in the project indicates that each is based on the belief that the child should learn certain sound-symbol relationships before beginning to read. None were of the "look-and-say" variety. One of the major problems in teaching these relationships is the inconsistency of the sound-symbol relationship of the English language. This occurs in two ways. First, a given phoneme may be represented by a number of different written symbols (graphemes). Second, a given letter or combination of letters can represent several different sounds. The ITA attempts to bring about consistency by altering the printed form of the language as an initial step in learning to read. The WIC program attempts to bring about consistency through color-coding where different letters or combinations of letters which represent the same sound are colored in the same way. The SCRP uses a relatively simple, phonetic, word-attack technique without altering the symbol system. The supplementary phonics program for the SCRP takes the position that the majority of our English monosyllables are phonetic, and therefore,that a phonic approach can contend with inconsistencies of the language at least in the initial stages of reading.

Each of the treatments is inclined toward the synthetic (phonetic) end of a continuum running from analytic to synthetic. The SCRP would be more like the typical basal reader approach used in the majority of the schools in the United States. Also, many of the youngsters in the control group were in classes where the teachers have used the same supplementary phonics program to supplement their basal readers. Too, the controls used the Houghton Mifflin basal readers. Since their basal readers were the same as the ones used by the SCRP treatment, the major difference between the SCRP treatment and the control group was the consultation and in-service training furnished from outside the school, rather than from within, the extra materials, the small stipend paid to the teachers, and whatever may have occurred in the way of school and teacher selection. Therefore, in this study there were two experimental reading approaches which differed considerably from the traditional approach to teaching beginning reading, and two conventional approaches, one with outside stimulation and motivation (the SCRP), and one in which the stimulation came from within the school.

Finally, the PLDK treatment is an oral stimulation program designed to stimulate oral language and verbal intelligence, and therefore to enhance school achievement. The program requires no reading or writing by the child.

Classroom Procedure

At the outset of the project, the supervisory staff recommended that the teachers should spend approximately 90 minutes per day in reading instruction. The amount of time the teacher actually spent in the teaching of reading for the first year of the project appears in Table 2 in Appendix A. During the first year, the median amount of time spent daily in formal reading instruction among the 39 teachers was 90 minutes. There was wide variation in the scheduled time for reading with a range from 75 to 145 minutes. Four teachers scheduled reading for 75 minutes, 1 for 80, 1 for 85, 16 for 90, 1 for 95, 3 for 105, 12 for 120, and 1 for 145 minutes. The teachers in the ITA and WIC treatments averaged about 90 minutes for reading, while the SCRP and control teachers averaged about 110 minutes. Teachers using PLDK in combination with a reading treatment tended to spend less time in formal reading instruction than those not using PLDK. Across all treatment, PLDK teachers taught reading an average of 93 minutes,while those not teaching PLDK averaged 106 minutes.

In the second year (1966-67), less variability occurred between teachers in the amount of time devoted to teaching reading. The teachers in the ITA, WIC, and SCRP treatments spent 98, 89, and 90 minutes, respectively. Contrary to the previous year, the teachers using PLDK spent about the same amount of time in reading instruction as the non-PLDK teachers (W/O = 92 minutes; W/1 = 89 minutes; W/2 = 97 minutes).

It was agreed at the beginning of the project that the experimental teachers would remain with the children for the two years of the treatment. The children were to be kept with the same teacher for the two years except for cases where this was not feasible. Thus, retention in the first grade, and special class placement were discouraged.

Where the experimental treatments involved basal readers and language kits not supplied by the Metro Schools, these were purchased.

In addition, $30 per year was allowed each teacher for consumable classroom supplies for both years of the project. In 1966-67, this money was used to furnish each experimental classroom with $30 worth of easy reading materials (books priced in the 29¢ to 59¢ range). The children were encouraged to read as many books as possible. A certificate with stars was used to record and reward the number of books each child read. At the end of the school year, all children were allowed to select one book to take home and keep.

The Teachers

Initially, 27 teachers participated in the experimental treatments, with 12 others serving as control teachers. The teachers were selected by their principal on the basis of their availability and willingness to participate in the study. All the participating teachers in any one school were assigned to the same treatment. This was necessary to facilitate the administration and supervision of the project and to provide a buddy-system feature. Due to the closing of a school, one teacher in the SCRP treatment was placed in a school where three teachers were in WIC program. Moreover, during the second year, changes in teaching personnel occurred in one class in the SCRP plus one-year PLDK group, and in one class of the ITA plus one-year PLDK group. In addition, both the WIC and SCRP treatments lost another teacher. Since many of the project children in these classes had been substantially reduced at the end of the first year, the remaining children were absorbed into other rooms. Therefore, for the second year, there were nine ITA teachers, eight WIC teachers, and eight SCRP teachers.

Background data were collected on the original project teachers. They cover four variables: 1) highest degree earned, 2) total years of teaching experience, 3) years teaching grade one, and 4) overall effectiveness in teaching reading through the assigned method (See Table 2). The two new teachers who joined the project for the 1966-67 school year were not given this evaluation. Examination of Table 2 reveals that, of the original teachers, 21 of the teachers had earned a B.A. degree while 17 had an M.A. There was one non-degree teacher in the SCRP plus PLDK treatment.

For years of experience, and years teaching first grade, four categories were established: 1) no teaching experience, 2) one to three years, 3) four to six years, and 4) seven or more years. Of the 39 teachers, the median for total years experience was in the seven or more category. There was only one teacher, in the SCRP treatment, who had no teaching experience. The median for years of teaching grade one was in the four to six year category. There were five of the original teachers in the project who were teaching grade one for the first time. Two were in the ITA plus PLDK treatment, one in WIC, one in WIC plus PLDK, and one in the SCRP.

Table 2

Comparison of Teachers on

Earned Degrees, Years Teaching Experience, Years Teaching Grade One and Observer Rating

Treatment Group	N	Highest Degree			Years Teaching Experience				Years Teaching Grade One				Observer Rating[1]				
		None	BA	MA	0	1-3	4-6	7+	0	1-3	4-6	7+	1	2	3	4	5
ITA	3	-	1	2	-	1	-	2	-	1	-	2	-	1	2	-	-
ITA plus PLDK	6	-	4	2	-	1	3	2	2	1	1	2	2	1	2	1	-
WIC	3	-	2	1	-	1	-	2	1	2	-	-	-	1	1	1	-
WIC plus PLDK	6	-	5	1	-	2	2	2	1	2	1	2	-	3	1	1	1
SCRP	3	-	1	2	1	-	-	2	1	1	-	1	1	-	3	4	-
SCRP plus PLDK	6	1	2	3	-	1	1	4	-	2	3	1	-	2	3	1	-
Control	12	-	6	6	-	2	2	8	-	3	6	3	1	3	3	4	1
Total	39	1	21	17	1	8	8	22	5	12	11	11	4	11	15	12	2

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[1] Rating #1 was designated as poor, and #5 as excellent.

To obtain ratings on overall effectiveness in teaching reading, one to three members of a team of evaluators rated each of the teachers. All three members of the team were educators holding an earned doctorate with competence in reading instruction, and were college instructors. They were not involved in the project in any other way than to rate the teachers. An evaluation sheet (see Appendix B) was prepared by the central research staff with the help of the evaluating team. A five point scale, where "1" designated a rating of poor and "5" designated a rating of excellent, was employed to obtain an overall rating score. To standardize rating procedures, the team and the consultant for each treatment visited one classroom in each treatment group. Following the visit, a consensus rating was arrived at through discussion among the evaluators. Questions concerning the expected procedures for implementing the program were discussed inlight of the observation. Every effort was made to standardize the evaluative criteria. After the standardization of the team on each treatment, teachers from the experimental groups and the control group were randomly assigned to each of the three members of the evaluating team. Evaluations were made during April and the first two weeks in May of the first year of the project.

The median rating for the total group of teachers was three (or average). Four teachers received a rating of one (or poor), two in the ITA plus PLDK, one in the SCRP, and one in the control group. There were two teachers who received a rating of five (or excellent). One each of these two teachers was in the WIC plus PLDK group and the control group. Furthermore, it should be noted that four teachers in the control group received a rating of four and one a five. Each of these teachers were members on the teaching staff of the only school in the district that is accredited by the Southern Association of Colleges and Schools. This school and its personnel meet a set of criteria that had not been met in any of the other schools participating in the project.

Supervision and Training of Teachers

Initial training sessions for teachers of all treatments were held during the first week in September, 1965. An orientation session attended by all teachers participating in the study was held during the first hour of the training program. This orientation session was conducted by the principal investigator for the Cooperative Reading Project plus the other research staff members. It included a summary statement about each of the treatments to be used, the introduction of the members of the investigating team and the consultants, and the introduction of the coordinating personnel from the Metropolitan Nashville-Davidson County Public Schools. After the orientation session, each treatment group met separately with their coordinator both for pre-service and in-service sessions, as well as for classroom observation. Each of the treatments had a Peabody-based coordinator.

The WIC materials arrived approximately 10 days prior to the pre-service training sessions. The WIC training sessions were held for two hours in the afternoon and two hours in the evening for three consecutive days. The sessions were conducted by a WIC consultant from the publisher and attended by the teachers and the local consultant for that group. Two hours each day were used for discussion and demonstration with a group of children. During the other two hours, the consultant explained the three stages of the WIC program and the materials to be used in these stages.

The SCRP had approximately seven hours of training sessions in September, 1965. At one meeting, a consultant from the publishers of the Reading for Meaning series met with the teachers. During this meeting, the use of the readiness book, the materials for the word recognition technique stressed in the program, and the teaching techniques and exercises associated with each of the series three preprimers, primer, and first reader were explained. Following the explanation of the first grade materials used in the program, an overview of the total primary program in the Reading for Meaning series was given. Furthermore, a list of all the materials that are published for use with it was provided. A consultant from the publisher of Reading with Phonics met with the group for another session. The SCRP teachers observed the consultant give an hour long demonstration lesson. Following the lesson, the teachers asked questions concerning the demonstration as well as about the program and its materials.

The ITA group met for pre-treatment sessions on four different days in September, 1965. The principal investigator for the CRP and his assistant, who worked as a consultant with the teachers during the year, conducted these meetings. They gave an overview of ITA and taught the teachers how to read and write in ITA. Too, the consultant taught a demonstration lesson with a group of children. The consultant also discussed teaching techniques for the ITA program.

The teachers using Peabody Language Development Kits met for six hours during the early portion of September, 1965, for their pre-service training. These training sessions were conducted by the principal investigator who was also the senior editor of the PLDK. There were three phases to this six hour training program. First, each teacher received the commercial version of the Level #1 kit, and was given the opportunity to examine it. Then, the kit's contents and their suggested use were discussed. Second, the consultant introduced the teaching manual for 1) the organization of the class, 2) the setting for the lessons, 3) the presentation of the lessons, and 4) the procedures for evaluating them. Third, the teachers observed a demonstration lesson with a small group of children.

Each of the treatment groups met on a regular basis during the 1965-66 school year. These sessions were generally held after school and scheduled twice a month. The consultants for the different treatments conducted these meetings. They discussed the teaching techniques and materials for their approach, shared ideas and materials prepared for their children, and occasionally presented prepared materials. These meetings were also used for handling administrative details such as ordering materials. The highlights of the sessions were usually dittoed and mailed to each teacher. In addition to these seminars, the consultants had responsibility for visiting the classrooms of the teachers in their treatment group. Each of the reading treatments received approximately four and one-half hours of visitation per week throughout the school year. The consultant for the WIC treatment was a doctoral student at George Peabody College, and also the female investigator in the CRP. Her supervisory experience had consisted of one semester spent in the supervision of six off-campus student teachers who were assigned to various grades in two elementary schools. The visitation in the SCRP was provided primarily by a candidate for the master's degree and to some extent by one of the male investigators in the CRP who served as consultant for this group. The graduate student began her visitation in mid-October, and did most of the visitation from that time until the end of the year. She had had no previous supervisory experience, but had taught the Reading for Meaning program in the first grade for four years. The visitation for the ITA treatment was done by an experienced teacher of ITA on leave from the Metropolitan School System who divided her time between the CRP and another project. She had a master's degree, 25 years teaching experience in the first and second grade, and had taught ITA in an experimental program the previous year. This person worked with the principal investigator for the CRP, who served as consultant for this group. Frequent classroom visitation to observe PLDK was not practiced. The principal investigator met with the PLDK teachers once a month. Each of the teachers completed daily evaluation sheets and turned them in at these monthly meetings.

The supervision and training program for the 1966-67 school year was similar to the plan used during the previous year. Two new consultants assumed responsibility for supervising the SCRP and WIC reading programs. The SCRP consultant was a candidate for the Ed.S. degree, with extensive experience in teaching the first grade. Although this consultant had no prior supervisory experience, she had some teaching experience as an instructor at a state college. The new WIC consultant had five years of teaching experience in the primary grades. In addition, she had spent two years as a supervisor for student teachers. Again, each of the experimental reading teachers received eight hours of in-service training prior to the beginning of school. The ITA and SCRP program had outside consultants for these meetings, while the WIC sessions were conducted by the project staff. In addition, the experimental reading teachers met twice each month for a one and one-half hour meeting throughout the year. Furthermore, regular visits to each classroom were also made by the investigators and the project consultants. Finally, the PLDK teachers received two four-hour training sessions on the commercial version of Level #2. This group also met four more times during the school year. Each PLDK teacher completed daily evaluation sheets and turned them in at these sessions. One of the authors of the kits served as consultant and coordinator at the pre-service and in-service meetings.

Evaluation Instruments

The efficacy of the programs were appraised in three important areas of development: intellectual functioning, language abilities, and school achievement.

Intellectual Functioning

The Stanford-Binet Intelligence Scale (S-B) was used to provide data on intellectual functioning. These data were obtained primarily for studying whether the program enhanced intellectual growth.

The S-B (Terman-Merrill, 1960) is a standardized, individual intelligence scale yielding mental age and intelligence quotient scores. Items range from simple manipulation of objects to abstract reasoning. They are grouped into age levels according to their difficulty, ranging from age two to superior adult. Although the test includes a number of performance-type items, particularly at lower age levels, it is essentially verbal. Reliability coefficients of earlier editions, especially the 1937 edition, range from 0.83 to 0.98 depending on age and IQ level (Sontag, Baker, & Nelson, 1958). Higher correlations are obtained at upper age levels, and at low IQ levels. Validity in predicting school achievement, particularly in more verbally oriented subjects such as language and reading, has been generally good. Bond (1940) reported correlation coefficients ranging from 0.43 to 0.73 between Binet scores and achievement in various school subjects among tenth grade youngsters. Although a restandardization of the scale was not carried out with 1960 edition, the test authors suggest the latest revision retains the main characteristics of the 1937 edition, including high reliability and validity.

The S-B is among the most widely used tests of general intelligence (Silverstein, 1963; Weise, 1963). It is the individual intelligence scale which has been demonstrated to be effective at the age and ability level of the subjects in the present sample. Moreover, it is essentially a verbal measure of intelligence. For these reasons, the S-B was felt to be a particularly suitable measure to assess the effects of the experimental treatments upon verbal intelligence.

Language Abilities

The *Illinois Test of Psycholinguistic Abilities* (ITPA) and the *Peabody Language Production Inventory* (PLPI) were used to provide data on language abilities. The ITPA was used as the principal measure of language skills; the PLPI was used as a supplement art test of oral expression.

The ITPA (McCarthy & Kirk, 1961) is an individually administered test measuring language abilities across the age range of 2-6 to 9-0 years of age. It yields age equivalent and standard scores on total language functioning and on each of the nine subtests. The following facets of oral language development are measured by the instrument:

1) Auditory decoding--the ability to understand spoken words.
2) Visual decoding--the ability to classify pictures from memory.
3) Auditory-vocal association--ability to reason by analogies.
4) Visual-motor association--ability to relate pictures in a meaningful way.
5) Vocal encoding--the ability to express ideas in spoken words.
6) Motor encoding--the ability to express ideas in gestures.
7) Auditory-vocal automatic--the ability to produce language automatically and accurately in a grammatical sense.
8) Auditory-vocal sequencing--the ability to reproduce a series of digits accurately from memory.
9) Visual-motor sequencing--the ability to reproduce a series of pictures from memory.

The ITPA is designed to measure two levels of meaning--the representational level (sub-tests one through six) on which subjects must deal meaningfully with language symbols, and the automatic-sequential level (sub-tests seven through nine) on which subjects deal with the non-meaningful use of language. Three processes of language are measured--decoding or reception, encoding or expression, and association. The latter process is described by the test authors as measuring the internal manipulation of symbols. The ITPA measures two stimulus channels (auditory and visual), and two response channels (vocal and motor).

Reliability is exceptionally high. A split-half reliability coefficient of 0.99 and a test-retest reliability coefficient of 0.97 have been reported for the standardization sample. At present, evidence of validity of the ITPA is limited. Early studies of the test have indicated fairly high correlations with measures of general intelligence. In the standardization of the test (McCarthy & Kirk, 1961), a correlation of 0.96 was obtained between age scores of the S-B and the ITPA. McCarthy and Olson (1964) reported an extensive study of the validity of the ITPA with a group of 86 children ranging in age from seven years to eight years, six months. They concluded that the concurrent, construct, and predictive validities of the ITPA are adequate,but the content and diagnostic validities are less adequate. The ITPA was selected as principal measure of language abilities on the basis of the promise it has shown in early studies and the extensive research its publication has stimulated. Besides, it is the only well developed test of oral language functioning which is generally available.

The Peabody Language Production Inventory (Nelson, 1964) is an individually-administered test measuring oral language ability. The test is administered by showing the subject a series of three pictures (street scene, Good Humor Man scene, operating room scene) and asking him to tell a story about the pictures. The responses are rated on three dimensions of language performance, namely level of abstraction, structural complexity, and general quality of speech. Responses to each picture are rated separately for level of abstraction and for structural complexity. A single rating of the general category is obtained for the entire test. The PLPI was included to provide data on oral language abilities in terms of the connected, free speech, of the subject. The PLPI data were used as a supplement to the ITPA data.

School Achievement

The Metropolitan Achievement Test (MAT) was used to provide school achievement data. It is a group-administered test. Following the first grade, the Primary Battery I was used. It consists of four subtests, namely, word knowledge, word discrimination, reading, and arithmetic. Standard scores, grade equivalents, percentiles, and the stanine scores are available. The test was standardized on a nationwide sample of school children. A test-retest reliability coefficient of 0.83 is reported for the total test. Subtest reliability coefficients based on corrected split-half method are 0.90 for word knowledge, 0.87 for word discrimination, 0.92 for reading comprehension, and 0.97 for arithmetic.

Following the second grade (1966-67), the Primary II Battery was administered. Only the word knowledge, word discrimination, reading, and spelling subtests were used. For the total test, a split-half reliability coefficient of 0.91 is reported. Subtest split-half reliability coefficients are 0.93 for word knowledge, 0.88 for word discrimination, 0.94 for reading comprehension, and 0.93 for spelling.

The MAT was selected as a measure of academic achievement because it is used throughout the Nashville-Davidson County Metropolitan Public Schools and is administered routinely each year. This not only allowed for direct comparison of school achievement between the experimental group and all other children in the school district, but also reduced test-administration problems.

Testing Schedule

The S-B, ITPA, and PLPI were given to most of the children prior to the beginning of school in the Fall of 1965. A few youngsters who were not tested prior to the beginning of school were tested during the first week of school. In the Spring of 1966 and 1967, the achievement tests were administered during the last four weeks of school by an examiner other than the classroom teacher. The teacher served as a monitor. The individual tests (S-B, ITPA, and PLPI) were readministered during the last six weeks of school in both years of the project (1965-66, and 1966-67).

the written and oral language tests, the PLDK lessons did not lead to any appreciable improvement in productivity scores. On the written language test, children with two and three years of PLDK experiences obtained significantly higher scores on correctness or syntax. Apparently, training from the PLDK lessons generalized to the proper usage of words, punctuation, as well as the formation of words. Oral language stimulation lessons enhanced the development of meaning or degree of abstraction as reflected by performance on both the oral and written language tests. Finally, there was generally no significant difference in the ability to write and tell stories from a picture between the ITA versus the TO groups.

In summary, the studies reviewed above suggest the effectiveness of ITA at the early stages of reading. However, even here the result of studies are equivocal. Nevertheless, generally, the studies provide a heartening support for the ITA approach, though the long-term advantages or disadvantages of using ITA is far from evident. Most of the experiments, including the Cooperative Language Development Project, tend to have the Hawthorn effect operating with the ITA teacher being involved in a novel approach, getting more recognition, perhaps having additional stimulation, materials, etc. at their disposal. Too, these studies have been conducted in local school systems, which could not possibly provide the rigidity of laboratory studies. Thus, it has been difficult to control for the teacher variable. The remarkable advantage of the second British study is that the same teachers taught the TO and the ITA groups. The fact that the results were not as dramatic as in the first study, may have in part been due to the teacher selection process, for certainly the novelty had worn off by the time of the second experiment. In any event, the evidence is far from clear and consistent that ITA is superior in teaching beginning reading to children generally, or to Southern children of the inter-city. Very clearly, in the Cooperative Language Development Project, a Hawthorn effect and probably the teacher selection factor were both operating to contribute to the success of the experimental treatment.

Research on the Words-in-Color Approach

Little in the way of systematic or sophisticated research has been conducted on the effectiveness of WIC. Essentially all of the articles in the literature are descriptive in nature. *Words-in-Color* is a rather recent development which is still not in very wide use throughout the United States. Demonstration projects were first begun in 1959. By 1963 a number of school systems in Ohio were trying out the Words-in-Color program. Since then a number of school systems in California, New York, Massachusetts, Maryland, and Texas have experimented with this approach. Probably due in large measure to the newness of *Words-in-Color*, there is little in the literature to suggest conditions under which it may be effective.

Bentley (1966) reported *Words-in-Color* being used in two first grade classes in an Ohio school district, and stated that children using Words-in-Color did well on the Stanford First Grade Reading Test. He also reported that it was enthusiastically received in a class for slow learning children (educable mentally retarded). Too, it was used successfully in Cleveland, Ohio with illiterate adults.

Hinnan (1964) reported on the effectiveness of WIC with a classroom of 32 first graders. By the end of the year, 18 of the children were reading between the third and six grade level, several reading at the second grade level, and all the others were reading first grade materials easily.

Bailey (1966) has completed the only reasonably sophisticated study involving the *Words-in-Color* as part of her doctoral dissertation here at Peabody, and as part of this very Cooperative Reading Project. For her dissertation, she compared the *Words-in-Color* approach with the supplemented reading approach reported in this monograph, with and without PLDK. When she wrote her study up, after the first year of this Cooperative Reading Project, there was no significant difference between the group receiving WIC instruction and the group using the supplemented basal reader approach. However, when *Words-in-Color* was combined with the oral language stimulation program provided by PLDK, the gain in reading exceeded those of the other groups. On the basis of these findings, Bailey reached a conclusion that neither reading approach could be thought of as superior to the other.

It is evident that the research literature is not extensive or intensive enough at this point to provide any support for the claims that *Words-in-Color* is superior in teaching children beginning reading. As with ITA, the involvement of the teachers in a novel approach and their resulting enthusiasm have been important factors in contributing to the success of *Words-in-Color* programs as seen by the subjective evaluations of those interested in this method. Nevertheless, there did seem to be enough suggestion about the virtue of *Words-in-Color* to justify its inclusion in the Cooperative Reading Project.

Research with Hay-Wingo Phonic Drills

Only one study is available that closely parallels what was done in this Cooperative Reading Project. This longitudinal study was conducted by Bear (1964), beginning in September 1956. Seven first-grade classes constituted the experimental group, and another seven classes the control group. Both groups used the basal reading series by Row-Peterson. In the case of the experimental group, the basal readers were supplemented by the 1954 edition of Reading with Phonics, published by Lippincott and popularly known as the Hay-Wingo System. One hundred and thirty-six first grade children were in the experimental group and 139 in the control group. At the end of the first grade, the pupils who received intensive phonetic drills scored significantly higher on both the Gates Primary Reading Test and the Metropolitan Achievement Test, as compared with control groups which were introduced gradually to phonics in the Row-Peterson Series. Bear concluded that the phonetic drills could be used successfully along with the basal reader program and would serve as a valuable supplement in developing reading skills. In 1959, Bear followed up these same pupils after they had completed their sixth grade. Overall, no differences persisted between the experimental and control groups on the Gates Reading Survey except in the area of vocabulary where the experimental group was significantly advanced. Furthermore, in a breakdown of the upper 25 percent of the subjects in terms of intelligence, as compared to the middle 50 percent of the group, in contrast with the lower 25 percent of the group, no differences were found between experimental and control groups in the slow and rapid learners groups. However, in the middle 50 percent group, the experimental group tended to be superior to the controls. On the basis of the follow-up study, Bear concluded that progress in improving reading programs is likely to be retarded unless educators try to compromise the two extreme positions taken by the adherent of the phonics versus the look-and-say approach. Proponents of the synthetic methods should refrain from developing reading programs that place undue stress on phonics to the neglect of other important skills in reading. Similarly, authors of basal reading programs should recognize that phonics would appear to be a valuable aid to beginning reading.

This one study provides some evidence that the Hay-Wingo may be used effectively as a supplement to basal readers. It was, therefore, incorporated into this present Cooperative Reading Study.

Some Concluding Observations on the Research Literature

In recent years there has been impressive volumes of more sophisticated research comparing the relative effectiveness of various methods of teaching reading. Improved statistical design, the use of inferential statistics, attempts to control or be aware of the teacher variable, and the Hawthorne effect have all helped provide the field with data on which to make judgement on how to teach what child by what method. Nevertheless, the milieu in which these studies have been conducted have been the public schools where the prime commitment is to the education of children. Thus, it has not been possible to conduct these studies with anything approaching rigorous laboratory controls. For example, in our Cooperative Language Development Project the rather glowing picture of the effectiveness of ITA may be due to any number of factors, including the possibility that ITA is superior to a basal reading program, especially for Southern disadvantaged children who neither hear nor speak all of the standard forty-odd sounds of English. However, it is equally probable that our results may have been due to a confounding of the teacher variable plus the Hawthorne effect. It was not possible to assign teachers randomly to experimental and control treatments. Instead, schools were assigned to one treatment or the other, largely based on the recommendation of the central office staff of the school system who probably had a tendency to assign the better schools, the better and more cooperative principals, and perhaps even the better teachers to the experimental treatments.

Furthermore, in our Cooperative Language Development Project motivation to excellence among the experimental teachers was extremely high, whereas no incentives were provided to the control teachers. Experimental teachers were provided with a small supplementary stipend and were asked to attend in-service training sessions throughout the year, approximately one every two or three weeks. They were provided with supplementary materials and were frequently visited by researchers, school officials, and others. Too, they were given considerable recognition by their principals. Furthermore, the experimental teachers had an opportunity to teach in teams, to observe each other teach, and to share ideas. They were visited regularly by a supervisor. In contrast the control teachers were not stimulated or supported in any way. Their children were simply tested at the beginning of the experiment and retested at the end of each school year thereafter. Thus, a very important part of the experimental treatment were the added incentives provided the experimental teachers and not the control teachers.

For these reasons, the staff embarked upon this second study known as the Cooperative Reading Project. In this particular case, we had three experimental reading treatments, and had equal stimulation for each of the experimental groups of teachers. In addition, we had our typical control group, who were not given additional stimulation. However, the same teachers did not teach all three approaches. In fact, in this case the bias may have been operating against ITA. Generally, new schools were identified to utilize the Words-in-Color approach and the supplemented basal reading approach. But we returned to the same schools for our experimental ITA teachers. There is some possibility that the first cadre of teachers in the school,who were initially selected for the Cooperative Language Development Project,may have had skills that surpassed those in the second echelon who were selected to teach ITA in the Cooperative Reading Project. Furthermore, by this time the enthusiasm and novelty of the ITA approach had fallen off in these schools as far as the principals were concerned. In addition, the central office staff who were responsible for ITA had probably lost some of their vigor and drive in this second experiment. Thus, a major intellectual exercise remains to interpret the results of research in reading without bias and most parsimoniously. While the investigators themselves discuss and interpret their results, the reader has an equal responsibility to add in his own interpretations of what factors may have contributed to the results.

CHAPTER II

METHOD

This chapter discusses, in more detail, the research method employed in the Cooperative Reading Project. It includes information concerning the setting, subjects, treatments, classroom procedures, teachers, and evaluation instruments.

Setting

The Cooperative Reading Project was conducted in schools which draw their pupils from lower socioeconomic areas of the Nashville-Davidson County Metropolitan School System. In these areas, the majority of the families are considered underprivileged, socially and economically, according to any standard. They are under-employed and ill-educated. Their children are more or less underfed and poorly clothed. Nashville-Davidson County, like any other metropolis, has a growing problem of slums and ghettoes. It has a school system of more than 100 elementary and secondary schools, enrolling about 100,000 children and youth. The schools are integrated, but in practice many remain segregated due largely to housing patterns. Approximately one-third of the schools involved in the Cooperative Reading Project were undergoing a dramatic shift in racial balance. They were moving from a majority of Caucasian to a majority of Negro students. Furthermore, many of the schools in the project area were overcrowded.

Although it was recognized that not all children enrolled in any given school located in a slum area could be described as disadvantaged, the nature of the project required that the experimental treatment be given to entire classrooms. Administrative personnel of the Metro Schools were asked to select those schools in which the large majority of children would be classified as disadvantaged. On the basis of these selections, 12 public elementary schools were asked to participate in the project. Nine of these schools were involved in the experimental treatment programs, three for each of the experimental reading treatments. The other three schools were selected to provide control subjects for the study.

In assigning reading treatments to the experimental schools, considerations were given to the size of the schools, the degree of racial integration, and also other aspects of school environment, so as to counterbalance the effects of these variables. The ITA treatments were given at the same schools which provided ITA instruction for the earlier Cooperative Language Development Project. Nine first grade classes were selected for each of the three reading treatment groups. This made a total of 27 experimental classes, and provided about 750 experimental subjects. About 150 first grade children were drawn from 12 first grade classes in the three control schools. This gave a total group of about 900 first grade children involved at the outset of the project.

Subjects

Unfortunately, several factors acted to reduce the size of the experimental sample. Due to limitations in terms of time and professional manpower, the project staff was able to obtain complete pretreatment psychometric test data on only 838 subjects, 712 in the experimental classes and 126 in the control classes. This constituted the original subject pool or sample size. This sample pool was reduced, during the two-year treatment period, due to children being transferred out of experimental schools, and, at the end of the school year, due to their not being available for posttesting. This left a total sample of about 538 subjects--473 in the combined experimental groups and 65 in the control groups--which constituted the final subject pool. Tables 1A and 1B in Appendix A contain complete reference data (CA, IQ, LA, etc.) by treatment group for the final sample pool. Examination of this table reveals that, at the outset of the experiment, the subjects in the final sample pool had a mean IQ of 88, 12 points below the national norm. Their initial language age was five years and three months; this was about one year below the average for their CA. The mean IQs and LAs for the final sample pool did not differ appreciably from the averages of the original subject pool (IQ = 87; LA = 5 yrs., 2 mos.). (The pretest data on the sample of children in the second-year analysis may be found in Table 3.)

Basic socioeconomic information, including the educational level of the best educated parent, housing conditions, and income level was obtained by ratings on the Peabody Cultural Opportunity Scale. These data confirmed that the project children came from disadvantaged backgrounds (see Table 1). Their families fell at the lower end of the socioeconomic continuum. On the average, the best educated parent of these children had about 11 years of schooling. The average number of persons per family was 6.76, which was larger than the national average of two parents and two to three children. The housing conditions of these families appear somewhat better than expected. This was due to the many new city housing and urban renewal projects that have been constructed in the inner city of Nashville. Homes in the housing projects were rated as fair. However, 30 percent of the families still lived in a house or in an apartment rated as extremely, or moderately, poor.

The total family incomes of the project children give a better indication of their socioeconomic status. Forty-two percent of these families earned an annual income of less than $3,000. Forty-six percent earned between $3,000 and $6,000 annually. Only 12 percent earned more than $6,000 per year. The main wage earners of these

Table 1

Basic Home and Family Information on the Final Sample Pool

Group	Percentage of Negro Race	Percentage of Families on Welfare	Average No. of Persons per Family	Mean Educ. Level of Parent*	Housing Conditions in Percentage				Income Level in Percentage			
					extremely poor	moderately poor	fair[1]	good	less than $3000	$3000-5999	$6000-8999	over $9000
ITA only	84	5	6.24	11.43	-	13	71	16	35	62	-	3
ITA/ 1 yr. PLDK	67	6	6.34	9.93	5	16	79	-	64	33	3	-
ITA/2 yrs. PLDK	98	5	6.85	11.00	8	5	59	28	40	50	5	5
WIC only	100	5	7.72	11.15	10	30	35	25	40	38	19	3
WIC/1 yr. PLDK	94	19	6.19	10.30	3	13	77	7	46	50	4	-
WIC/2 yrs. PLDK	95	18	6.59	10.56	21	5	59	15	60	30	5	5
SCRP only	87	11	7.11	11.18	7	45	26	22	31	54	15	-
SCRP/1 yr. PLDK	96	4	6.25	10.46	14	25	39	22	32	57	11	-
SCRP/2 yrs. PLDK	86	6	6.74	11.09	18	35	35	12	21	47	26	6
Control	88	22	7.15	10.78	17	15	59	9	48	46	4	2
Total	89	11	6.76	10.81	11	19	55	15	42	46	9	3

*Educational level by of the best educated parent by self report.

[1] Most of the Federal Housing Project families were classified as in fair housing; many of the lowest income level families lived in these housing projects.

families were employed mostly as household,personal, maintenance, community service workers, day laborers, or semi-skilled laborers. A few were employed as skilled laborers, clerical, and salesworkers. Very few of the occupations fell in the professional, technical, and managerial ranks (for details concerning the classification of occupations used in this project, see Appendix B). (In an earlier survey of the original subject pool for this study, Mercer (1967) found that 14 percent of these families were receiving welfare assistance.) In the project sample, 11 percent were on welfare assistance rolls.

On the basis of socioeconomic status information, children were deleted from the final evaluation who came from families that: 1) the total family income was over $9,000, 2) lived in a very good house or apartment, 3) lived in a good house or apartment, and the total family income was over $6,000, 4) the main wage earner was employed as a professional, technical, or a managerial worker, or 5) the best educated parent had four or more years of college training.

Treatments

The following is a description of each of the reading and the oral language program.

Initital Teaching Alphabet

The *Early-to-Read Series* developed by Mazurkiewicz and Tanyzer (1963) was used in the experiment. This series consists of eight textbooks and five workbooks designed to take the child from the beginning reading level through the transition to traditional orthography (TO) at the high third grade level. The ITA, devised by Sir James Pitman in England, has 44 symbols instead of the 26 symbols in TO. Twenty-four of the symbols are the traditional ones, while 14 are new. Each of the ITA symbols represents one phoneme, thus furnishing consistency between the sound-symbol relationship. Only the lower-case form of characters are used, with capitalization being achieved by using larger versions of the lower-case letters.

The Mazurkiewicz and Tanyzer program is based on the premise that children should first learn the individual sound-symbol relationships before they are taught to synthesize them into words. Therefore, in the beginning stages of the program, the sounds and their corresponding symbols are learned in isolation and in key words. When a few of the sound symbols are learned, the child is taught to synthesize them into simple words. Once the 44 symbols are associated with their sounds, the child develops the concept of blending the sounds into larger words. Thus, he should be able to read (decode) any word.

The last two textbooks in the series (#7 and #8) are designed to make the transition from ITA to TO. When the transition was completed, the children in the experiment moved into Book 2 of the Basic Reading Series by McCracken and Walcutt, published by J. B. Lippincott Company. This program has a systematic phonic approach which was developed from the same rationale as the Reading with Phonics program and appeared to be especially appropriate as a follow-up for the i/t/a Early-to-Read Series.

Words in Color

The Words in Color program (Gattegno, 1963) is organized around a phonetic analysis of the English language as it is spoken. It utilizes color to facilitate the learning and recognition of the basic speech sounds used in reading. Under this system, each of the 47 speech sounds of English identified by Gattegno is expressed with a specific color. Individual letters (or groups of letters) are colored according to how they sound in a given word. For example, the underlined portion of the following words would appear in the same color because they all represent the same sound: late, way, waite, they, and straight. In contrast, the underlined portion of the following words would be in a different color because, although the spelling is identical, each word represents a different speech sound: thought, though, bough, and through.

The short sounds of the vowels are introduced first using colored chalk at the chalkboard. From the very beginning, the program stresses that the learner takes over the responsibility of producing the sounds associated with the signs. Until the pupils can vocalize the oral model accurately, the teacher is urged to give the auditory model, accompanied by the visual model. Thereafter, the teacher supplies the visual model and the pupils vocalize its speech equivalent. The modeling is usually done with only one or two of the short vowels. Then the teacher gives the children the opportunity to produce the remaining vowel-consonant combinations without vocal prompting. The WIC materials consist of colored phonic code wall charts, colored word building wall charts, worksheets, a word building book, three pupil books, color-keyed word cards, and a book of stories.

This program is basically designed to build word attack skills. It is supposed to be completed within a relatively short period of time, usually 12 weeks, with average and above average children. This initial period is then followed by any basal reading program. During the first year of the treatment, the WIC teachers did not formally go into a specific basal reading program. However, during the Spring, several levels of the Basic Reading Series by McCracken and Walcutt were placed in their rooms as supplementary materials. This reading series was continued into the second year.

Supplemented Conventional Reading Program

The Supplemented Conventional Reading Program (SCRP) used a basal reading series supplemented by a phonics program. The basal program was the Reading for Meaning series by McKee, Harrison, McCowen, and Lehr (1963), published by Houghton Mifflin. This program was supplemented by the Reading with Phonics program, published by Lippincott and known as the Hay and Wingo phonic drills (1960).

The Houghton Mifflin Basal Reading Series is based on the premise that the typical English-speaking child brings to school a sizable speaking vocabulary, and that the major problem he encounters in beginning reading is finding a way to convert a printed word into its familiar spoken form. To accomplish this, a single technique is employed for unlocking new words. This consists of using both the context of the sentence and the beginning sound of the word. Later in the program some ending and middle sounds are used. At the pre-reading level, 18 single (one letter) consonants and 4 digraphs (sh, wh, th, ch) are taught. The other consonants and the vowels, plus common endings and other syllables, are taught as they are needed. The basic vocabulary is carefully controlled. As new words are introduced, the teacher helps the children learn them by using the program's basic word-attack technique. The teacher's guides which accompany each of the readers furnish: 1) detailed lesson plans, 2) suggestions for meeting the needs of fast and slow learners, and 3) suggestions for the use of numerous supplementary materials produced as a part of the program.

Reading with Phonics, by Hay and Wingo, is not a basic reading program, but is a skills program designed to make the child independent in word recognition. It makes the assumption, as does the Reading for Meaning program, that first grade children already have a large speaking vocabulary and, therefore, they need a word recognition program. The materials consist of one textbook and three workbooks. The phonetic elements are learned through the auditory, visual, and kinesthetic senses. The children are first taught to listen for a sound, and then to associate the sound and its visual symbol. Kinesthetic development takes place in the correct movement of the tongue and eyes, and the development of hand and arm through writing (Hay & Wingo, 1960).

Language Stimulation

The oral language stimulation was furnished, during the first year of the experiment, through the use of the Peabody Language Development Kit (PLDK), Level #1, (Dunn & Smith, 1965). During the second year, Level #2 of the PLDK was used (Dunn & Smith, 1966). The commercial versions of both Levels #1 and #2 were used. This program was taught daily to the whole class in 30 minute lessons. The PLDK is designed to stimulate oral language and verbal intelligence by training the processes of reception, expression, and conceptualization. Reception is provided through the three modalities of sight, hearing, and touch. Expression is provided through both the vocal and motor channels. The lessons concentrate on the development of verbal intelligence, focusing upon divergent, convergent, and associative thinking. They are designed for children functioning intellectually between the four and one-half to the eight year age levels.

There are a total of 23 different types of activities in the PLDK. Representative of these are brainstorming, classification, conversation, critical thinking, describing, imagination, listening, memory, pantomine, relationship, story, and vocabulary building time. Each kit contains 180 daily lessons. The lessons include from two to four activities selected from the 23 categories. Emphasis is placed on sequencing the difficulty of the activities from the beginning to the end of the school year.

Even though teacher participation is inevitable, the overall goal of the PLDK is to allow maximum participation by the children, giving them an opportunity to talk, think, and learn effectively in a situation with less formal structure than a regular academic period. Language time is designed to provide a period where all the children can participate and feel that they are successful. Teachers are encouraged to use much positive reinforcement, to vary activities, and to involve all children. No reading or writing is required.

Summary of Treatments

The description of the three reading programs in the project indicates that each is based on the belief that the child should learn certain sound-symbol relationships before beginning to read. None were of the "look-and-say" variety. One of the major problems in teaching these relationships is the inconsistency of the sound-symbol relationship of the English language. This occurs in two ways. First, a given phoneme may be represented by a number of different written symbols (graphemes). Second, a given letter or combination of letters can represent several different sounds. The ITA attempts to bring about consistency by altering the printed form of the language as an initial step in learning to read. The WIC program attempts to bring about consistency through color-coding where different letters or combinations of letters which represent the same sound are colored in the same way. The SCRP uses a relatively simple, phonetic, word-attack technique without altering the symbol system. The supplementary phonics program for the SCRP takes the position that the majority of our English monosyllables are phonetic, and therefore,that a phonic approach can contend with inconsistencies of the language at least in the initial stages of reading.

Each of the treatments is inclined toward the synthetic (phonetic) end of a continuum running from analytic to synthetic. The SCRP would be more like the typical basal reader approach used in the majority of the schools in the United States. Also, many of the youngsters in the control group were in classes where the teachers have used the same supplementary phonics program to supplement their basal readers. Too, the controls used the Houghton Mifflin basal readers. Since their basal readers were the same as the ones used by the SCRP treatment, the major difference between the SCRP treatment and the control group was the consultation and in-service training furnished from outside the school, rather than from within, the extra materials, the small stipend paid to the teachers, and whatever may have occurred in the way of school and teacher selection. Therefore, in this study there were two experimental reading approaches which differed considerably from the traditional approach to teaching beginning reading, and two conventional approaches, one with outside stimulation and motivation (the SCRP), and one in which the stimulation came from within the school.

Finally, the PLDK treatment is an oral stimulation program designed to stimulate oral language and verbal intelligence, and therefore to enhance school achievement. The program requires no reading or writing by the child.

Classroom Procedure

At the outset of the project, the supervisory staff recommended that the teachers should spend approximately 90 minutes per day in reading instruction. The amount of time the teacher actually spent in the teaching of reading for the first year of the project appears in Table 2 in Appendix A. During the first year, the median amount of time spent daily in formal reading instruction among the 39 teachers was 90 minutes. There was wide variation in the scheduled time for reading with a range from 75 to 145 minutes. Four teachers scheduled reading for 75 minutes, 1 for 80, 1 for 85, 16 for 90, 1 for 95, 3 for 105, 12 for 120, and 1 for 145 minutes. The teachers in the ITA and WIC treatments averaged about 90 minutes for reading, while the SCRP and control teachers averaged about 110 minutes. Teachers using PLDK in combination with a reading treatment tended to spend less time in formal reading instruction than those not using PLDK. Across all treatment, PLDK teachers taught reading an average of 93 minutes,while those not teaching PLDK averaged 106 minutes.

In the second year (1966-67), less variability occurred between teachers in the amount of time devoted to teaching reading. The teachers in the ITA, WIC, and SCRP treatments spent 98, 89, and 90 minutes, respectively. Contrary to the previous year, the teachers using PLDK spent about the same amount of time in reading instruction as the non-PLDK teachers (W/O = 92 minutes; W/1 = 89 minutes; W/2 = 97 minutes).

It was agreed at the beginning of the project that the experimental teachers would remain with the children for the two years of the treatment. The children were to be kept with the same teacher for the two years except for cases where this was not feasible. Thus, retention in the first grade, and special class placement were discouraged.

Where the experimental treatments involved basal readers and language kits not supplied by the Metro Schools, these were purchased.

In addition, $30 per year was allowed each teacher for consumable classroom supplies for both years of the project. In 1966-67, this money was used to furnish each experimental classroom with $30 worth of easy reading materials (books priced in the 29¢ to 59¢ range). The children were encouraged to read as many books as possible. A certificate with stars was used to record and reward the number of books each child read. At the end of the school year, all children were allowed to select one book to take home and keep.

The Teachers

Initially, 27 teachers participated in the experimental treatments, with 12 others serving as control teachers. The teachers were selected by their principal on the basis of their availability and willingness to participate in the study. All the participating teachers in any one school were assigned to the same treatment. This was necessary to facilitate the administration and supervision of the project and to provide a buddy-system feature. Due to the closing of a school, one teacher in the SCRP treatment was placed in a school where three teachers were in WIC program. Moreover, during the second year, changes in teaching personnel occurred in one class in the SCRP plus one-year PLDK group, and in one class of the ITA plus one-year PLDK group. In addition, both the WIC and SCRP treatments lost another teacher. Since many of the project children in these classes had been substantially reduced at the end of the first year, the remaining children were absorbed into other rooms. Therefore, for the second year, there were nine ITA teachers, eight WIC teachers, and eight SCRP teachers.

Background data were collected on the original project teachers. They cover four variables: 1) highest degree earned, 2) total years of teaching experience, 3) years teaching grade one, and 4) overall effectiveness in teaching reading through the assigned method (See Table 2). The two new teachers who joined the project for the 1966-67 school year were not given this evaluation. Examination of Table 2 reveals that, of the original teachers, 21 of the teachers had earned a B.A. degree while 17 had an M.A. There was one non-degree teacher in the SCRP plus PLDK treatment.

For years of experience, and years teaching first grade, four categories were established: 1) no teaching experience, 2) one to three years, 3) four to six years, and 4) seven or more years. Of the 39 teachers, the median for total years experience was in the seven or more category. There was only one teacher, in the SCRP treatment, who had no teaching experience. The median for years of teaching grade one was in the four to six year category. There were five of the original teachers in the project who were teaching grade one for the first time. Two were in the ITA plus PLDK treatment, one in WIC, one in WIC plus PLDK, and one in the SCRP.

Table 2

Comparison of Teachers on

Earned Degrees, Years Teaching Experience, Years Teaching Grade One and Observer Rating

Treatment Group	N	Highest Degree			Years Teaching Experience				Years Teaching Grade One				Observer Rating[1]				
		None	BA	MA	0	1-3	4-6	7+	0	1-3	4-6	7+	1	2	3	4	5
ITA	3	-	1	2	-	1	-	2	-	1	-	2	-	1	2	-	-
ITA plus PLDK	6	-	4	2	-	1	3	2	2	1	1	2	2	1	2	1	-
WIC	3	-	2	1	-	1	-	2	1	2	-	-	-	1	1	1	-
WIC plus PLDK	6	-	5	1	-	2	2	2	1	2	1	2	-	3	1	1	1
SCRP	3	-	1	2	1	-	-	2	1	1	-	1	1	-	3	4	-
SCRP plus PLDK	6	1	2	3	-	1	1	4	-	2	3	1	-	2	3	1	-
Control	12	-	6	6	-	2	2	8	-	3	6	3	1	3	3	4	1
Total	39	1	21	17	1	8	8	22	5	12	11	11	4	11	15	12	2

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[1] Rating #1 was designated as poor, and #5 as excellent.

To obtain ratings on overall effectiveness in teaching reading, one to three members of a team of evaluators rated each of the teachers. All three members of the team were educators holding an earned doctorate with competence in reading instruction, and were college instructors. They were not involved in the project in any other way than to rate the teachers. An evaluation sheet (see Appendix B) was prepared by the central research staff with the help of the evaluating team. A five point scale, where "1" designated a rating of poor and "5" designated a rating of excellent, was employed to obtain an overall rating score. To standardize rating procedures, the team and the consultant for each treatment visited one classroom in each treatment group. Following the visit, a consensus rating was arrived at through discussion among the evaluators. Questions concerning the expected procedures for implementing the program were discussed inlight of the observation. Every effort was made to standardize the evaluative criteria. After the standardization of the team on each treatment, teachers from the experimental groups and the control group were randomly assigned to each of the three members of the evaluating team. Evaluations were made during April and the first two weeks in May of the first year of the project.

The median rating for the total group of teachers was three (or average). Four teachers received a rating of one (or poor), two in the ITA plus PLDK, one in the SCRP, and one in the control group. There were two teachers who received a rating of five (or excellent). One each of these two teachers was in the WIC plus PLDK group and the control group. Furthermore, it should be noted that four teachers in the control group received a rating of four and one a five. Each of these teachers were members on the teaching staff of the only school in the district that is accredited by the Southern Association of Colleges and Schools. This school and its personnel meet a set of criteria that had not been met in any of the other schools participating in the project.

Supervision and Training of Teachers

Initial training sessions for teachers of all treatments were held during the first week in September, 1965. An orientation session attended by all teachers participating in the study was held during the first hour of the training program. This orientation session was conducted by the principal investigator for the Cooperative Reading Project plus the other research staff members. It included a summary statement about each of the treatments to be used, the introduction of the members of the investigating team and the consultants, and the introduction of the coordinating personnel from the Metropolitan Nashville-Davidson County Public Schools. After the orientation session, each treatment group met separately with their coordinator both for pre-service and in-service sessions, as well as for classroom observation. Each of the treatments had a Peabody-based coordinator.

The WIC materials arrived approximately 10 days prior to the pre-service training sessions. The WIC training sessions were held for two hours in the afternoon and two hours in the evening for three consecutive days. The sessions were conducted by a WIC consultant from the publisher and attended by the teachers and the local consultant for that group. Two hours each day were used for discussion and demonstration with a group of children. During the other two hours, the consultant explained the three stages of the WIC program and the materials to be used in these stages.

The SCRP had approximately seven hours of training sessions in September, 1965. At one meeting,a consultant from the publishers of the *Reading for Meaning* series met with the teachers. During this meeting, the use of the readiness book, the materials for the word recognition technique stressed in the program, and the teaching techniques and exercises associated with each of the series three preprimers, primer, and first reader were explained. Following the explanation of the first grade materials used in the program, an overview of the total primary program in the *Reading for Meaning* series was given. Furthermore, a list of all the materials that are published for use with it was provided. A consultant from the publisher of *Reading with Phonics* met with the group for another session. The SCRP teachers observed the consultant give an hour long demonstration lesson. Following the lesson, the teachers asked questions concerning the demonstration as well as about the program and its materials.

The ITA group met for pre-treatment sessions on four different days in September, 1965. The principal investigator for the CRP and his assistant, who worked as a consultant with the teachers during the year, conducted these meetings. They gave an overview of ITA and taught the teachers how to read and write in ITA. Too, the consultant taught a demonstration lesson with a group of children. The consultant also discussed teaching techniques for the ITA program.

The teachers using *Peabody Language Development Kits* met for six hours during the early portion of September, 1965, for their pre-service training. These training sessions were conducted by the principal investigator who was also the senior editor of the PLDK. There were three phases to this six hour training program. First, each teacher received the commercial version of the Level #1 kit,and was given the opportunity to examine it. Then, the kit's contents and their suggested use were discussed. Second, the consultant introduced the teaching manual for 1) the organization of the class, 2) the setting for the lessons, 3) the presentation of the lessons, and 4) the procedures for evaluating them. Third, the teachers observed a demonstration lesson with a small group of children.

Each of the treatment groups met on a regular basis during the 1965-66 school year. These sessions were generally held after school and scheduled twice a month. The consultants for the different treatments conducted these meetings. They discussed the teaching techniques and materials for their approach, shared ideas and materials prepared for their children, and occasionally presented prepared materials. These meetings were also used for handling administrative details such as ordering materials. The highlights of the sessions were usually dittoed and mailed to each teacher. In addition to these seminars, the consultants had responsibility for visiting the classrooms of the teachers in their treatment group. Each of the reading treatments received approximately four and one-half hours of visitation per week throughout the school year. The consultant for the WIC treatment was a doctoral student at George Peabody College, and also the female investigator in the CRP. Her supervisory experience had consisted of one semester spent in the supervision of six off-campus student teachers who were assigned to various grades in two elementary schools. The visitation in the SCRP was provided primarily by a candidate for the master's degree and to some extent by one of the male investigators in the CRP who served as consultant for this group. The graduate student began her visitation in mid-October, and did most of the visitation from that time until the end of the year. She had had no previous supervisory experience, but had taught the Reading for Meaning program in the first grade for four years. The visitation for the ITA treatment was done by an experienced teacher of ITA on leave from the Metropolitan School System who divided her time between the CRP and another project. She had a master's degree, 25 years teaching experience in the first and second grade, and had taught ITA in an experimental program the previous year. This person worked with the principal investigator for the CRP, who served as consultant for this group. Frequent classroom visitation to observe PLDK was not practiced. The principal investigator met with the PLDK teachers once a month. Each of the teachers completed daily evaluation sheets and turned them in at these monthly meetings.

The supervision and training program for the 1966-67 school year was similar to the plan used during the previous year. Two new consultants assumed responsibility for supervising the SCRP and WIC reading programs. The SCRP consultant was a candidate for the Ed.S. degree, with extensive experience in teaching the first grade. Although this consultant had no prior supervisory experience, she had some teaching experience as an instructor at a state college. The new WIC consultant had five years of teaching experience in the primary grades. In addition, she had spent two years as a supervisor for student teachers. Again, each of the experimental reading teachers received eight hours of in-service training prior to the beginning of school. The ITA and SCRP program had outside consultants for these meetings, while the WIC sessions were conducted by the project staff. In addition, the experimental reading teachers met twice each month for a one and one-half hour meeting throughout the year. Furthermore, regular visits to each classroom were also made by the investigators and the project consultants. Finally, the PLDK teachers received two four-hour training sessions on the commercial version of Level #2. This group also met four more times during the school year. Each PLDK teacher completed daily evaluation sheets and turned them in at these sessions. One of the authors of the kits served as consultant and coordinator at the pre-service and in-service meetings.

Evaluation Instruments

The efficacy of the programs were appraised in three important areas of development: intellectual functioning, language abilities, and school achievement.

Intellectual Functioning

The Stanford-Binet Intelligence Scale (S-B) was used to provide data on intellectual functioning. These data were obtained primarily for studying whether the program enhanced intellectual growth.

The S-B (Terman-Merrill, 1960) is a standardized, individual intelligence scale yielding mental age and intelligence quotient scores. Items range from simple manipulation of objects to abstract reasoning. They are grouped into age levels according to their difficulty, ranging from age two to superior adult. Although the test includes a number of performance-type items, particularly at lower age levels, it is essentially verbal. Reliability coefficients of earlier editions, especially the 1937 edition, range from 0.83 to 0.98 depending on age and IQ level (Sontag, Baker, & Nelson, 1958). Higher correlations are obtained at upper age levels, and at low IQ levels. Validity in predicting school achievement, particularly in more verbally oriented subjects such as language and reading, has been generally good. Bond (1940) reported correlation coefficients ranging from 0.43 to 0.73 between Binet scores and achievement in various school subjects among tenth grade youngsters. Although a restandardization of the scale was not carried out with 1960 edition, the test authors suggest the latest revision retains the main characteristics of the 1937 edition, including high reliability and validity.

The S-B is among the most widely used tests of general intelligence (Silverstein, 1963; Weise, 1963). It is the individual intelligence scale which has been demonstrated to be effective at the age and ability level of the subjects in the present sample. Moreover, it is essentially a verbal measure of intelligence. For these reasons, the S-B was felt to be a particularly suitable measure to assess the effects of the experimental treatments upon verbal intelligence.

Language Abilities

The *Illinois Test of Psycholinguistic Abilities* (ITPA) and the *Peabody Language Production Inventory* (PLPI) were used to provide data on language abilities. The ITPA was used as the principal measure of language skills; the PLPI was used as a supplement art test of oral expression.

The ITPA (McCarthy & Kirk, 1961) is an individually administered test measuring language abilities across the age range of 2-6 to 9-0 years of age. It yields age equivalent and standard scores on total language functioning and on each of the nine subtests. The following facets of oral language development are measured by the instrument:

1) Auditory decoding--the ability to understand spoken words.
2) Visual decoding--the ability to classify pictures from memory.
3) Auditory-vocal association--ability to reason by analogies.
4) Visual-motor association--ability to relate pictures in a meaningful way.
5) Vocal encoding--the ability to express ideas in spoken words.
6) Motor encoding--the ability to express ideas in gestures.
7) Auditory-vocal automatic--the ability to produce language automatically and accurately in a grammatical sense.
8) Auditory-vocal sequencing--the ability to reproduce a series of digits accurately from memory.
9) Visual-motor sequencing--the ability to reproduce a series of pictures from memory.

The ITPA is designed to measure two levels of meaning--the representational level (sub-tests one through six) on which subjects must deal meaningfully with language symbols, and the automatic-sequential level (sub-tests seven through nine) on which subjects deal with the non-meaningful use of language. Three processes of language are measured--decoding or reception, encoding or expression, and association. The latter process is described by the test authors as measuring the internal manipulation of symbols. The ITPA measures two stimulus channels (auditory and visual), and two response channels (vocal and motor).

Reliability is exceptionally high. A split-half reliability coefficient of 0.99 and a test-retest reliability coefficient of 0.97 have been reported for the standardization sample. At present, evidence of validity of the ITPA is limited. Early studies of the test have indicated fairly high correlations with measures of general intelligence. In the standardization of the test (McCarthy & Kirk, 1961), a correlation of 0.96 was obtained between age scores of the S-B and the ITPA. McCarthy and Olson (1964) reported an extensive study of the validity of the ITPA with a group of 86 children ranging in age from seven years to eight years, six months. They concluded that the concurrent, construct, and predictive validities of the ITPA are adequate, but the content and diagnostic validities are less adequate. The ITPA was selected as principal measure of language abilities on the basis of the promise it has shown in early studies and the extensive research its publication has stimulated. Besides, it is the only well developed test of oral language functioning which is generally available.

The Peabody Language Production Inventory (Nelson, 1964) is an individually-administered test measuring oral language ability. The test is administered by showing the subject a series of three pictures (street scene, Good Humor Man scene, operating room scene) and asking him to tell a story about the pictures. The responses are rated on three dimensions of language performance, namely level of abstraction, structural complexity, and general quality of speech. Responses to each picture are rated separately for level of abstraction and for structural complexity. A single rating of the general category is obtained for the entire test. The PLPI was included to provide data on oral language abilities in terms of the connected, free speech, of the subject. The PLPI data were used as a supplement to the ITPA data.

School Achievement

The Metropolitan Achievement Test (MAT) was used to provide school achievement data. It is a group-administered test. Following the first grade, the Primary Battery I was used. It consists of four subtests, namely, word knowledge, word discrimination, reading, and arithmetic. Standard scores, grade equivalents, percentiles, and the stanine scores are available. The test was standardized on a nationwide sample of school children. A test-retest reliability coefficient of 0.83 is reported for the total test. Subtest reliability coefficients based on corrected split-half method are 0.90 for word knowledge, 0.87 for word discrimination, 0.92 for reading comprehension, and 0.97 for arithmetic.

Following the second grade (1966-67), the Primary II Battery was administered. Only the word knowledge, word discrimination, reading, and spelling subtests were used. For the total test, a split-half reliability coefficient of 0.91 is reported. Subtest split-half reliability coefficients are 0.93 for word knowledge, 0.88 for word discrimination, 0.94 for reading comprehension, and 0.93 for spelling.

The MAT was selected as a measure of academic achievement because it is used throughout the Nashville-Davidson County Metropolitan Public Schools and is administered routinely each year. This not only allowed for direct comparison of school achievement between the experimental group and all other children in the school district, but also reduced test-administration problems.

Testing Schedule

The S-B, ITPA, and PLPI were given to most of the children prior to the beginning of school in the Fall of 1965. A few youngsters who were not tested prior to the beginning of school were tested during the first week of school. In the Spring of 1966 and 1967, the achievement tests were administered during the last four weeks of school by an examiner other than the classroom teacher. The teacher served as a monitor. The individual tests (S-B, ITPA, and PLPI) were readministered during the last six weeks of school in both years of the project (1965-66, and 1966-67).

CHAPTER III

RESULTS AND DISCUSSION

The results for the final year of the study (1966-67) are reported in this chapter. Since the treatments were administered to all children in the classroom, the groups were not comparable in size, or on the variables of IQ, CA, LA, and sex. In dealing with this problem, a number of procedures were adopted. First, subjects were eliminated who did not meet the criteria set-up for disadvantaged children (see Chapter 2). Second, subjects with CAs, at initiation of the project, of above 90 months (7-6) and/or IQs below 60 or above 112 were also excluded. Finally, samples of proportional size for each sex were randomly drawn from the final sample pool of subjects for each of the treatment groups. This resulted in a selected sample of 408 subjects (207 boys, 201 girls) being drawn from 538 subjects of the final subject pool (see Appendix A, Tables 1A and 1B. A summary of the pretest data for this selected sample for each treatment group appears in Table 3. The means for CA, IQ, MA, and LA for the total sample, including both the experimental and control groups, were 73.95 months, 86.73 points, 65.00 months, and 62.22 months, respectively. Analyses of variance (see Table 4) indicated that the selected samples were comparable on all these variables (the .05 level of confidence was used).

Results

Results from the intervention treatments at the end of the final (second) year of the study are reported below for each of the three areas of evaluation: intellectual functioning, linguistic abilities, and academic achievement. A summary of the basic descriptive data on these three areas for the sample subjects is reported for each treatment group in Tables 5, 12, and 15. A summary of descriptive data for the final sample pool is presented in Table 1-A in Appendix A. Complete test data by subjects on all variables are presented in Appendix C for readers who are interested in either reanalyzing the data, or using it for other purposes.

Two statistical analyses were conducted on each dependent variable. First, a two by four factorial analysis of variance (Sex x four PLDK treatments) was conducted to compare PLDK treatment groups with both the controls and the pupils who participated in the experimental reading programs, but did not receive PLDK. This analysis will be referred to hereafter as the PLDK analysis. Second, three-way analyses of variance (Method of teaching reading x PLDK x Sex) were conducted to observe the treatment effects of the various methods of teaching reading and PLDK groups (including a non-PLDK group) for the pupils in the experimental reading programs only. This analysis is being designated as the

Table 3

Summary of Pretest Data on the Selected Samples by Treatment Groups of 408 Subjects Used for the Second Year Analyses

Treatment Group	N	CA		IQ		MA		LA	
		$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s
ITA only									
Boys	22	73.5909	3.8130	88.7727	12.0077	67.0454	8.8560	64.7727	7.5904
Girls	22	73.8636	4.3350	86.8181	11.3838	64.9090	7.6281	62.5454	6.9471
Total	44	73.7272	4.0374	87.7954	11.6053	65.9772	8.2394	63.6590	7.2787
ITA-One year PLDK									
Boys	22	75.4090	3.9848	84.5909	10.0696	64.7272	7.1994	60.8180	11.5745
Girls	22	74.4545	3.8267	85.2727	12.8441	64.5000	8.6506	59.6363	7.6692
Total	44	74.9318	3.8905	84.9318	11.4107	64.6136	7.8659	60.2272	9.7216
ITA-Two years PLDK									
Boys	22	74.3181	4.7354	87.0000	10.2585	65.2272	7.5149	58.7727	8.0560
Girls	22	73.0454	3.3169	86.3181	10.0686	63.9090	6.5826	63.2272	7.9700
Total	44	73.6818	4.0908	86.6590	10.0512	64.5681	7.0133	61.0000	8.2335
WIC only									
Boys	22	73.7272	3.8077	87.8636	11.0597	65.6818	8.1439	62.0454	10.8825
Girls	22	73.8181	3.7632	82.7272	10.0439	62.0909	6.3088	61.4090	8.2330
Total	44	73.7727	3.7410	85.2954	10.7588	63.8863	7.4249	61.7272	9.5417
WIC-One year PLDK									
Boys	22	73.3636	3.7742	86.5454	12.5196	64.4090	9.0011	63.3181	8.0145
Girls	16	73.1875	2.3157	90.3125	11.6029	66.7500	8.2421	66.6875	8.0557
Total	38	73.2894	3.2048	88.1315	12.1283	65.3947	8.6542	64.7368	8.0998
WIC-Two years PLDK									
Boys	22	74.3181	4.4875	87.9090	10.3647	66.0454	7.2277	62.2727	10.4526
Girls	22	73.8636	3.5095	86.1818	10.0268	64.5909	6.9738	63.8636	10.0205
Total	44	74.0909	3.9873	87.0454	10.1157	65.3181	7.0575	63.0681	10.1512
SCRP only									
Boys	15	75.2666	3.7129	87.3333	9.7371	66.5333	7.0395	61.2000	5.2671
Girls	15	74.3333	3.5190	92.4666	9.8118	69.3333	7.7982	63.1333	6.1630
Total	30	74.8000	3.5854	89.9000	9.9528	67.9333	7.4369	62.1666	5.7183
SCRP-One year PLDK									
Boys	15	74.3333	4.7762	86.6000	13.4046	65.3333	10.0191	62.5333	8.7250
Girls	15	74.6666	5.1783	86.6666	8.9897	65.4000	5.1796	63.6000	7.7071
Total	30	74.5000	4.8972	86.6333	11.2142	65.3666	7.8369	63.0666	8.1070
SCRO-Two years PLDK									
Boys	15	74.6666	4.4992	91.7333	11.2915	68.8666	8.2193	63.8000	9.5633
Girls	15	73.6666	5.4863	83.9333	8.2504	62.6666	5.1366	61.7333	7.4496
Total	30	74.1666	4.9560	87.8333	10.4950	65.7666	7.4359	62.7666	8.4883
Experimental Total									
Boys	177	74.2824	4.1375	87.4802	11.0901	65.8757	8.0549	62.1299	9.1637
Girls	171	73.8596	3.8981	86.5029	10.6310	64.7309	7.1950	62.7426	7.9674
Total	348	74.0747	4.0209	87.0000	10.8622	65.3132	7.6548	62.4310	8.5897
Control									
Boys	30	73.6666	4.3423	83.6333	10.0944	62.7000	7.2309	60.6666	6.7690
Girls	30	72.8333	3.6400	86.6666	10.2230	63.6666	6.7435	61.4000	6.3114
Total	60	73.2500	3.9941	85.1500	10.1877	63.1833	6.9490	61.0333	6.4990
Grand Total									
Boys	207	74.1932	4.1622	86.9227	11.0120	65.4154	8.0033	61.9178	8.8579
Girls	201	73.7064	3.8695	86.5273	10.5463	64.5721	7.1230	62.5422	7.7437
Total	408	73.9534	4.0229	86.7279	10.7737	65.0000	7.5847	62.2254	8.3233

Table 4

Analysis of Variance of Pretest Data by Treatment Groups of 408 Subjects

Variable	Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio
CA	Between Groups	9	131.5657	14.6184	0.9009
	Within Groups	398	6458.0181	16.2261	
	Total	407	6589.5838		
IQ	Between Groups	9	901.3969	100.1552	0.8588
	Within Groups	398	46415.3813	116.6215	
	Total	407	47316.7782		
MA	Between Groups	9	610.0707	67.7856	1.1813
	Within Groups	398	22836.9849	57.3793	
	Total	407	23447.0556		
LA	Between Groups	9	982.2156	109.1350	1.7539
	Within Groups	398	24765.0439	62.2237	
	Total	407	25747.2595		

Reading by PLDK analysis. In the case of the one achievement test analysis, the latter design was extended to a fourth dimension to include the four written language subtest scores. Finally, subject attrition resulted in a disproportionately small number of girls in the WIC group, with one year of PLDK, for the IQ, MA, LA, and PLPI analyses. To meet the criterion of proportionality in the analyses of variance, the mean of this group was substituted for the six missing subjects. All degrees of freedom were appropriately corrected. (The 0.10 level of confidence was used to evaluate the effectiveness of the treatments.)

Intellectual Functioning

Both IQ and MA scores from the Stanford-Binet Intelligence Scale were obtained. Means and standard deviations on the pretest, posttest, and gain scores are presented in Table 5 for both IQ and MA scores. Results from the analyses of variance on IQ gains appear in Tables 6 and 7.

In the PLDK analysis, no significant difference was found between groups receiving PLDK as compared to those who did not receive the treatment. Moreover, no significant difference in IQ gain was obtained between boys and girls. Analysis of the PLDK x Sex interaction indicated a significant difference between boys and girls in the control group only. Within the control group, boys were found to make significantly greater IQ gains than the girls (boys = 3.33; girls = 1.10). In the Reading x PLDK analysis, no significant differences were found in mean IQ gain between methods of teaching reading, PLDK, or between boys and girls. Finally, none of the interactions between these three basic dimensions was found to be significant.

Analyses of variance on MA gains are presented in Tables 8 and 9. In the PLDK analysis, no significant differences in mean MA gains were found between PLDK and non-PLDK groups, or between boys and girls. Furthermore, the PLDK x Sex interaction did not reach statistical significance. In the Reading by PLDK analysis, a statistically significant difference was obtained between the experimental reading groups. Further analyses indicated that both the SCRP and WIC reading groups obtained greater MA gains than the ITA reading group (SCRP = 21.87; WIC = 21.60; ITA = 19.43). Furthermore, a significant Method of teaching reading x PLDK x Sex interaction was obtained. A breakdown of this interaction produced a number of significant comparisons:

1. Among the girls who did not receive PLDK, the WIC group made significantly greater MA gains than the SCRP group (WIC = 21.23; SCRP = 14.87).

2. Among the girls in the SCRP reading group, the one year PLDK group made significantly greater gains than the group which did not receive PLDK (W/1 = 24.93; W/0 = 14.87). Also, girls receiving two years of PLDK obtained significantly greater

Table 5

Means and Standard Deviations on the Selected Sample for Intellectual and Language Development

Pre, Post and Gain Scores

Treatment Group	N		SB-IQ			SB-MA			ITPA-LA		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain
ITA only											
Boys	22	$\bar{X}$	88.7727	93.0000	4.2273	67.0454	88.8181	21.7727	64.7727	81.1363	16.3636
		S	12.0077	13.5962		8.8560	12.9677		7.5904	11.5071	
Girls	22	$\bar{X}$	86.8181	88.1818	1.3637	64.9090	84.7727	19.8637	62.5454	79.5454	17.0000
		S	11.3838	11.8347		7.6281	11.1010		6.9471	13.2656	
Total	44	$\bar{X}$	87.7954	90.5909	2.7955	65.9772	86.7954	20.8182	63.6590	80.3409	16.6819
		S	11.6053	12.8304		8.2394	12.1035		7.2787	12.2985	
ITA-One year PLDK											
Boys	22	$\bar{X}$	84.5909	86.2272	1.6363	64.7272	84.7272	20.0000	60.8180	81.2272	20.4092
		S	10.0696	12.2124		7.1994	10.9685		11.5745	12.5660	
Girls	22	$\bar{X}$	85.2727	85.2727	0.0000	64.5000	81.6818	17.1818	59.6363	77.7272	18.0909
		S	12.8441	14.8234		8.6506	13.4850		7.6692	14.1530	
Total	44	$\bar{X}$	84.9318	85.7500	0.8182	64.6136	83.2045	18.5909	60.2272	79.4772	19.2500
		S	11.4107	13.4304		7.8659	12.2449		9.7216	13.3444	
ITA-two years PLDK											
Boys	22	$\bar{X}$	87.0000	86.3636	-0.6364	65.2272	82.5909	17.3637	58.7727	78.6818	19.9091
		S	10.2585	14.4307		7.5149	13.0371		8.0560	10.3895	
Girls	22	$\bar{X}$	86.3181	88.4090	2.0909	63.9090	84.3181	20.4091	63.2272	77.1363	13.9091
		S	10.0686	11.3965		6.5826	10.0969		7.9700	8.0436	
Total	44	$\bar{X}$	86.6590	87.3853	-0.7263	64.5681	83.4545	18.8864	61.0000	77.9090	16.9090
		S	10.0512	12.8919		7.0133	11.5568		8.2335	9.2156	
WIC only											
Boys	22	$\bar{X}$	87.8636	89.6363	1.7727	65.6818	86.5454	20.8636	62.0454	80.2272	18.1818
		S	11.0597	13.2758		8.1439	13.1140		10.8825	13.5013	
Girls	22	$\bar{X}$	82.7272	86.7272	4.0000	62.0909	83.3181	21.2272	61.4090	75.5454	14.1364
		S	10.0439	14.0517		6.3088	11.1503		8.2330	9.7040	
Total	44	$\bar{X}$	85.2954	88.1818	2.8864	63.8863	84.9318	21.0455	61.7272	77.8863	16.1591
		S	10.7588	13.5891		7.4249	12.1395		9.5417	11.8583	
WIC-one year PLDK											
Boys	22	$\bar{X}$	86.5454	89.0454	2.5000	64.4090	85.6818	21.2728	63.3181	79.7727	16.4546
		S	12.5196	16.9045		9.0011	15.6947		8.0145	11.7065	
Girls	16	$\bar{X}$	90.3125	92.6250	2.3125	66.7500	88.4375	21.6875	66.6875	79.8750	13.1875
		S	11.6029	13.1497		8.2421	11.9942		8.0557	9.3799	
Total	38	$\bar{X}$	88.1315	90.5526	2.4211	65.3947	86.8421	21.4474	64.7368	79.8157	15.0789
		S	12.1283	15.3460		8.6542	14.1431		8.0998	10.6517	
WIC-two years PLDK											
Boys	22	$\bar{X}$	87.9090	90.2727	2.3637	66.0454	87.6363	21.5909	62.2727	84.2727	22.0000
		S	10.3647	15.1601		7.2277	13.1930		10.4526	11.2724	
Girls	22	$\bar{X}$	86.1818	90.8181	4.6363	64.5909	87.6363	23.0454	63.8636	81.3636	17.5000
		S	10.0268	13.2618		6.9738	13.4999		10.0205	12.0813	
Total	44	$\bar{X}$	87.0454	90.5454	3.5000	65.3181	87.6363	22.3182	63.0681	82.8181	19.7500
		S	10.1157	14.0787		7.0575	13.1912		10.1512	11.6407	
SCRP only											
Boys	15	$\bar{X}$	87.3333	91.8666	4.5333	66.5333	90.2666	23.7333	61.2000	82.8000	21.6000
		S	9.7371	14.4415		7.0395	10.1735		5.2671	9.1667	
Girls	15	$\bar{X}$	92.4666	88.2000	-4.2666	69.3333	84.2000	14.8667	63.1333	83.0000	19.8667
		S	9.8118	11.4965		7.7982	11.3023		6.1630	11.8983	
Total	30	$\bar{X}$	89.9000	90.0333	1.3330	67.9333	87.2333	19.3000	62.1666	82.9000	20.7334
		S	9.9528	12.9602		7.4369	11.0069		5.7183	10.4365	
SCRP-one year PLDK											
Boys	15	$\bar{X}$	86.6000	88.7333	2.1333	65.3333	84.9333	19.6000	62.5333	81.0000	18.4667
		S	13.4046	10.5660		10.0191	8.4809		8.7250	9.9928	
Girls	15	$\bar{X}$	86.6666	93.9333	7.2667	65.4000	90.3333	24.9333	63.6000	85.6666	22.0666
		S	8.9897	10.6870		5.1796	9.1627		7.7071	11.7880	
Total	30	$\bar{X}$	86.6333	91.3333	4.7000	65.3666	87.6333	22.2667	63.0666	83.3333	20.2667
		S	11.2142	10.7715		7.8369	9.0991		8.1070	10.9964	
SCRP-two years PLDK											
Boys	15	$\bar{X}$	91.7333	96.1333	4.4000	68.8666	92.9333	24.0667	63.8000	84.0666	20.2666
		S	11.2915	14.7739		8.2193	13.3710		9.5633	10.7670	
Girls	15	$\bar{X}$	83.9333	90.8000	6.8667	62.6666	86.6666	24.0000	61.7333	81.3333	19.6000
		S	8.2504	13.7695		5.1366	11.5245		7.4496	10.4791	
Total	30										
Total	30	$\bar{X}$	87.8333	93.4666	5.6333	65.7666	89.8000	24.0334	62.7666	82.7000	19.9334
		S	10.4950	14.2920		7.4359	12.6719		8.4883	10.5512	
Experimental Total											
Boys	177	$\bar{X}$	87.4802	89.8926	2.4124	65.8757	86.8587	20.9830	62.1299	81.3276	19.1977
		S	11.0901	14.0857		8.0549	12.7119		9.1637	11.3087	
Girls	171	$\bar{X}$	86.5029	89.1403	2.6374	64.7309	85.4444	20.7135	62.7426	79.7485	17.0059
		S	10.6310	12.8258		7.1950	11.6489		7.9674	11.5036	
Total	348	$\bar{X}$	87.0000	89.5229	2.5229	65.3132	86.1637	20.8505	62.4310	80.5517	18.1207
		S	10.8622	13.4673		7.6548	12.2043		8.5897	11.4157	
Control											
Boys	30	$\bar{X}$	83.6333	86.9666	3.3333	62.7000	83.1333	20.4333	60.6666	77.3666	16.7000
		S	10.0944	13.4845		7.2309	11.8809		6.7690	10.5489	
Girls	30	$\bar{X}$	86.6666	85.5666	1.1000	63.6666	80.7000	17.0334	61.4000	75.3333	13.9333
		S	10.2230	11.0039		6.7435	9.6244		6.3140	8.4745	
Total	60	$\bar{X}$	85.1500	86.2666	1.1166	63..833	81.9166	18.7233	61.0333	76.3500	15.3167
		S	10.1877	12.2225		6.9490	10.7899		6.4990	9.5417	
Grand Total											
Boys	207	$\bar{X}$	86.9227	89.4685	2.5458	65.4134	86.3188	20.9034	61.9178	80.7536	18.8358
		S	11.0120	14.0064		8.0033	12.6356		8.8579	11.2640	
Girls	201	$\bar{X}$	86.5273	88.6069	2.0796	64.5721	84.7363	20.1642	62.5422	79.0895	16.5473
		S	10.5463	12.6101		7.1230	11.4737		7.7437	11.1975	
Total	408	$\bar{X}$	86.7279	89.0441	2.3162	65.0000	85.5392	20.5392	62.2254	79.9338	17.7084
		S	10.7737	13.3272		7.3847	12.0883		8.3233	11.2483	

Table 6

Analysis of Variance on IQ Gains in the PLDK Analysis as Measured by the Stanford-Binet Intelligence Scale

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (PLDK)	3	146.8189	48.9396	0.4751	2.08
B (Sex)	1	21.8568	21.8568	0.2122	2.71
A x B interaction	3	648.2546	216.0848	2.0981*	2.08
Error	400	41195.2998	102.9882		
Total	407	42012.2301			

$^{*}p < .10$

Table 7

Analysis of Variance on IQ Gains in the Reading by PLDK Analysis as Measured by the Stanford-Binet Intelligence Scale

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (Method of Teaching Reading	2	258.7546	129.3773	1.2177	2.30
B (PLDK)	2	45.8664	22.9332	0.2158	2.30
C (Sex)	1	4.0522	4.0522	0.0381	2.71
A x B	4	620.535	155.1337	1.4601	1.94
A x C	2	79.2616	39.6308	0.3730	2.30
B x C	2	371.2425	185.6212	1.7471	2.30
A x B x C	4	682.7600	170.69	1.6065	1.94
Error	330	35060.6219	106.2443		
Total	347	37123.0942			

Table 8

Analysis of Variance on MA Gains in the PLDK Analysis as Measured by the Stanford-Binet Intelligence Scale

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (PLDK)	3	299.3307	99.7769	1.2231	2.08
B (Sex)	1	49.9999	49.9999	0.6129	2.71
A x B interaction	*3*	*447.3726*	*149.1242*	*1.828*	2.08
Error	400	32630.5017	81.5762		
Total	407	33427.2049			

Table 9

Analysis of Variance on MA Gains in the Reading by PLDK Analysis as Measured by the Stanford-Binet Intelligence Scale

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (Method of Teaching Reaoing)	2	435.5970	217.7985	2.6209*	2.30
B (PLDK)	2	66.2562	33.1281	0.3986	2.30
C (Sex)	1	4.9534	4.9534	0.0596	2.71
A x B	4	501.8532	125.4633	1.5097	1.94
A x C	2	4.9534	2.4767	0.0298	2.30
B x C	2	71.2096	35.6048	0.4284	2.30
A x B x C	4	918.7395	229.6848	2.7639**	1.94
Error	330	27422.8347	83.0994		
Total	347	29426.3970			

$^{*}p < .10$
$^{**}p < .05$

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MA gains than the group who did not receive PLDK (W/2 = 24.00; W/0 = 14.87). No significant difference was obtained between the one-year and two-year PLDK groups.

3. In the SCRP group which did not receive PLDK, boys obtained significantly greater MA gains than girls (boys = 23.73; girls = 14.87). All other comparisons involving boys and girls failed to reach statistical significance.

Thus, girls in the WIC reading group made significantly greater gains in MA than did the girls in the SCRP group. Moreover, among girls in the SCRP reading group, both the one- and two-year PLDK groups surpassed the non-PLDK group. Finally, significant differences between boys and girls occurred in the SCRP, non-PLDK, group only.

In summary, no significant differences on IQ gains were obtained between the PLDK and non-PLDK groups, or between the experimental reading groups. In most comparisons, the SCRP and WIC reading groups made significantly greater gains in MA in comparison to the ITA group. These findings, however, were reversed among girls who did not receive PLDK. In this group, girls in the WIC reading program made significantly greater MA gains than girls in the SCRP reading group. Furthermore, analysis of a significant Method of teaching reading x PLDK x Sex interaction indicated significant differences in favor of the PLDK treatments over the non-PLDK group only among girls in the SCRP reading group. Finally, significant differences in favor of boys were obtained on IQ gains within the control group, and also on MA gains within the SCRP reading group which did not receive PLDK.

Language Abilities

Language abilities were measured by the Illinois Test of Psycholinguistic Abilities and the Peabody Language Production Inventory. Means and standard deviations on the ITPA-LA pretest, posttest, and gain scores are presented in Table 5. Results from the analyses of variance on LA gains are presented in Tables 10 and 11. The control group was found significantly inferior to the experimental reading groups on all comparisons. That is, the controls were significantly inferior on LA gain scores when compared to experimental reading groups which did not receive PLDK, as well as in comparisons with the groups which received one and two years of PLDK. No significant differences were obtained between the groups receiving PLDK and the experimental reading subjects who did not receive PLDK (W/0 = 17.86; W/1 = 18.20; W/2 = 18.86; C = 15.32). Boys gained significantly more in LA than did the girls (boys = 18.84; girls = 16.55).

In the Reading x PLDK x Sex analysis in Table 11, significant differences were obtained on LA gains among reading groups. A breakdown of this main effect indicated that the SCRP group gained significantly more on LA than either the ITA or WIC groups (SCRP = 20.31;

Table 10

Analysis of Variance on Language Age Gain Scores in the PLDK Analysis as Measured by the Illinois Test of Psycholinguistic Abilities

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (PLDK)	3	473.2888	157.7629	2.1044*	2.08
B (Sex)	1	589.1607	589.1607	7.859***	2.71
A x B	3	144.5184	48.1728	0.6425	
Error	400	29986.2007	74.9655		
Total	407	31193.1686			

*p <.10
***p <.01

Table 11

Analysis of Variance of Language Age Gains in the Reading by PLDK Analysis as Measured by the Illinois Test of Psycholinguistic Abilities

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (Method of Teaching Reading	2	656.7473	328.3736	4.3180**	2.30
B (PLDK)	2	93.6044	46.8022	0.6154	2.30
C (Sex)	1	476.8878	476.8878	6.2709**	2.71
A x B	4	665.6527	166.4131	2.1881*	1.94
A x C	2	254.7121	127.356	1.6746	2.30
B x C	2	141.9746	70.9873	0.9334	2.30
A x B x C	4	229.2421	57.3105	0.7536	1.94
Error	330	25095.6798	76.0475		
Total	347	27614.5008			

*p <.10
**p <.05

ITA = 17.61; WIC = 16.28). No significant difference was obtained between the ITA and WIC groups. Again, as in the previous analysis, the boys were found to make significantly greater gains in LA (boys = 19.20; girls = 17.01). Moreover, a significant Method of teaching reading x PLDK interaction was obtained. This interaction was accounted for by differences obtained within the WIC reading group. In the WIC reading group, the subjects who received two years of PLDK made significantly greater gains than the subjects receiving no PLDK, or one year of PLDK (W/0 = 16.16; W/1 = 15.08; W/2 = 19.75).

On the Peabody Language Production Inventory (PLPI), only the posttest scores were used in the statistical analyses. Means and standard deviations on the PLPI posttest scores are presented by treatment group in Table 12. In the PLDK analysis in Table 13, a significant main effect was found for PLDK. The one-year PLDK group obtained significantly higher PLPI scores than the control group, the non-PLDK group, and the two-year PLDK group (W/0 = 67.69; W/1 = 73.48; W/2 = 69.98; Control = 67.58). Furthermore, the group receiving two years of PLDK obtained significantly higher scores than both the experimental reading subjects who did not receive PLDK, and the control group. Finally, no significant difference was obtained between boys and girls, and the PLDK x Sex interaction did not reach statistical significance.

In the Method of teaching reading x PLDK x Sex analysis in Table 14, significant main effects were obtained on the method of teaching reading and on PLDK. Both the ITA and WIC reading groups obtained significantly higher scores than the SCRP group (ITA = 70.88; WIC = 71.14; SCRP = 68.18). Again, significant differences between the PLDK groups resulted from the superiority of the one-year PLDK group over both the two-year PLDK and the non-PLDK groups (W/0 = 67.69; W/1 = 73.48; W/2 = 69.98). Additionally, the two-year PLDK group obtained higher scores than the non-PLDK group. No significant differences were obtained between the scores of boys and girls. A breakdown of the Method of teaching reading x PLDK interaction produced the following results:

1. Within the SCRP group, subjects receiving two years of PLDK obtained significantly higher scores than those who did not receive PLDK (W/2 = 70.57; W/0 = 65.47). However, no significant differences were obtained between subjects receiving one year of PLDK and those groups which either did not receive PLDK, or received PLDK for two years.

2. In the one-year PLDK group, significant differences occurred between experimental reading groups. The WIC pupils obtained significantly higher scores than those in the SCRP group (WIC = 75.63; SCRP = 68.54). However, no differences were obtained between the ITA reading group when compared to either the SCRP or WIC groups, separately. The differences between reading treatments among groups receiving no PLDK, or PLDK for two years, did not reach statistical significance.

Table 12

Means and Standard Deviation for Posttest Scores on the

Peabody Language Production Inventory

Treatment Group	Boys			Girls			Total		
	N	$\overline{X}$	S	N	$\overline{X}$	S	N	$\overline{X}$	S
ITA without PLDK	21	64.9523	7.6846	22	70.5000	5.2349	43	67.7906	7.0498
with 1 yr. PLDK	22	75.7272	8.587	20	73.5500	11.4683	42	74.6904	9.9965
with 2 yr. PLDK	22	72.0000	11.9203	22	68.5454	10.4734	44	70.2727	11.2258
Total	65	70.9846	10.4545	64	70.7812	9.4643	129	70.8837	9.9370
WIC without PLDK	22	70.1818	13.2508	22	68.0000	13.2915	44	69.0909	13.1623
with 1 yr. PLDK	22	74.6818	7.9306	16	76.9375	8.3623	38	75.6315	8.0824
with 2 yr. PLDK	22	69.0000	9.7149	22	69.5909	8.7541	44	69.2954	9.1439
Total	66	71.2878	10.6596	60	70.9666	11.0270	126	71.1349	10.7936
SCRP without PLDK	15	65.2000	7.1833	15	65.7333	8.1282	30	65.4666	7.5420
with 1 yr. PLDK	13	67.5384	10.3008	15	69.4000	6.1038	28	68.5357	8.2079
with 2 yr. PLDK	15	69.4000	10.2036	15	71.7333	4.3009	30	70.5666	7.7848
Total	43	67.372	9.2405	45	68.9555	6.7083	88	68.1818	8.0381
Experimental Total	174	70.2068	10.3213	169	70.3609	9.4237	343	70.2827	9.8752
Control	30	65.3000	9.9208	30	69.8666	11.1997	60	67.5833	10.7393
Grand Total	204	69.4852	10.3866	199	70.2864	9.6826	403	69.8808	10.0408

Table 13

Analysis of Variance of Posttest Scores in the PLDK Analysis on the Peabody Language Production Inventory

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (PLDK)	3	2447.1451	815.7150	8.4675***	2.08
B (Sex)	1	117.6489	117.6489	1.2212	2.71
A x B interaction	3	266.3104	88.7701	0.9214	2.08
Errors	395	38052.2787	96.3348		
Total	402	40883.3831			

***p <.01

Table 14

Analysis of Variance of Posttest Scores in the Reading by PLDK Analysis on the Peabody Language Production Inventory

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (Method of Teaching Reading	2	610.4197	305.2098	3.3604**	2.30
B (PLDK)	2	2044.8751	1022.4375	11.2574***	2.30
C (Sex)	1	19.7881	19.7881	0.2178	2.71
A x B interaction	4	709.9161	177.4790	1.9541*	1.94
A x C interaction	2	37.7479	18.8731	0.2078	2.30
B x C interaction	2	51.3545	25.6772	0.2827	2.30
A x B x C	4	594.1952	148.5488	1.6355	1.94
Error	326	29608.2331	90.8228		
Total	343	33676.5297			

*p <.10
**p <.05
***p <.01

In summary, the experimental reading subjects displayed significantly higher LA gains than the control group. Differences in overall LA were obtained between the non-PLDK and the PLDK pupils only within the WIC reading group. In the WIC group, the two-year PLDK group made significantly higher LA gains than the non-PLDK, and one-year PLDK groups. Boys made significantly greater LA gains than girls. Within the experimental reading groups, the SCRP pupils gained significantly more in LA than either the ITA or WIC groups. On the PLPI, both the one- and two-year PLDK groups scored significantly higher than the control and non-PLDK groups. Moreover, the one-year PLDK group obtained significantly higher PLPI scores than the two-year group. Finally, the ITA and WIC reading groups were generally superior to the SCRP group in terms of LA gains.

School Achievement

Appraisal of school achievement was made by means of the *Metropolitan Achievement Test* (MAT) given in traditional orthography to all subjects. Grade equivalent scores from the four written language subtests were employed in the statistical analyses. The MAT subtests include Word Knowledge (WK), Word Discrimination (WD), Reading (R), and Spelling (S). Means and standard deviations of these posttest scores for each treatment group are presented in Table 15. Results of the analyses of variance of school achievement are presented in Tables 16 and 17.

The results of the PLDK analysis appear in Table 16. The results indicated that both the PLDK and non-PLDK experimental reading groups were significantly superior to the control group in overall achievement. Both non- and the two-year PLDK experimental groups obtained significantly higher MAT scores than the one-year PLDK and control groups, but they did not differ significantly in overall achievement from each other. Furthermore, the one-year PLDK group was significantly superior to the control group. Thus, the experimental reading group not receiving PLDK obtained the highest grade equivalent score (2.76), followed in consecutive order by the two-year PLDK group (2.68), the one-year PLDK group (2.48), and the control group (2.21). Finally, girls obtained significantly higher grade equivalent scores than the boys (girls = 2.76; boys = 2.40).

The Method of teaching reading x PLDK x Sex analysis appears in Table 17. First, a significant main effect was obtained for methods of teaching. The SCRP group was significantly higher in average achievement in comparison to either the ITA or the WIC group (SCRP = 2.92; ITA = 2.62; WIC = 2.47). Also, the ITA pupils were significantly superior to those in the WIC reading group. Second, the significant main effect for PLDK indicated that the group receiving two years of PLDK and the group not receiving PLDK significantly surpassed the one-year PLDK group in overall achievement (W/0 = 2.76; W/1 = 2.48; W/2 = 2.68). There was no significant difference, however, between those who did not receive PLDK, and those who received PLDK for two

Table 15

Means and Standard Deviations of Posttest Grade Equivalent Scores on the Written Language Subtests of the Metropolitan Achievement Test

Treatment Group	N	WK		WD		R		S		Average	
		$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s
ITA only											
Boys	22	2.218	0.686	2.559	0.861	2.359	0.745	2.077	0.856	2.303	0.752
Girls	22	2.923	0.919	3.368	1.555	3.054	1.028	3.127	1.259	3.118	1.015
Total	44	2.570	0.877	2.964	1.087	2.707	0.954	2.602	1.189	2.711	0.975
ITA-One Year PLDK											
Boys	22	2.277	0.768	2.604	0.980	2.432	0.745	2.364	1.319	2.419	0.849
Girls	22	2.154	0.718	2.473	1.418	2.373	0.773	2.436	1.480	2.359	0.993
Total	44	2.216	0.738	2.539	1.057	2.402	0.751	2.400	1.386	2.389	0.914
ITA-Two Years PLDK											
Boys	22	2.604	1.104	2.900	1.095	2.400	0.767	2.573	0.987	2.619	0.911
Girls	22	2.932	1.041	3.191	1.027	2.491	0.616	2.936	1.044	2.888	0.824
Total	44	2.768	1.073	3.045	1.060	2.445	0.689	2.754	1.021	2.753	0.869
WIC only											
Boys	22	2.173	0.514	2.504	0.886	2.245	0.574	1.991	0.901	2.228	0.666
Girls	22	2.490	0.808	2.977	1.040	2.704	0.963	2.845	1.200	2.754	0.938
Total	44	2.332	0.688	2.741	0.984	2.475	0.817	2.418	1.134	2.491	0.847
WIC-One Year PLDK											
Boys	22	2.282	0.810	2.432	1.006	2.186	0.764	2.168	1.188	2.267	0.905
Girls	16	2.550	0.738	2.962	0.886	2.756	0.770	2.819	1.135	2.894	0.403
Total	38	2.395	0.782	2.655	0.982	2.426	0.808	2.442	1.195	2.480	0.889
WIC-Two Years PLDK											
Boys	22	2.145	0.779	2.614	1.174	2.300	0.856	2.300	1.060	2.340	0.874
Girls	22	2.282	0.425	2.977	0.930	2.441	0.522	2.459	0.863	2.540	0.613
Total	44	2.214	0.624	2.795	1.063	2.370	0.704	2.380	0.958	2.440	0.753
SCRP only											
Boys	15	2.787	0.891	3.413	1.052	2.853	0.866	3.147	1.156	3.050	0.923
Girls	15	3.153	0.874	3.720	0.970	3.133	0.709	3.647	1.112	3.413	0.846
Total	30	2.970	0.887	3.567	1.006	2.993	0.790	3.397	1.143	3.232	0.890
SCRP-One Year PLDK											
Boys	15	2.373	0.896	2.433	0.919	2.240	0.694	2.093	1.170	2.285	0.866
Girls	15	2.753	0.889	3.153	0.943	2.760	0.636	3.027	1.331	2.923	0.872
Total	30	2.563	0.898	2.793	0.986	2.500	0.705	2.560	1.319	2.604	0.914
SCRP-Two Years PLDK											
Boys	15	2.807	0.565	3.380	0.665	2.440	0.429	3.120	0.956	2.937	0.530
Girls	15	2.540	0.623	3.133	1.092	2.553	0.437	3.420	1.117	2.912	0.711
Total	30	2.673	0.599	3.257	0.855	2.497	0.430	3.270	1.033	2.924	0.616
Control											
Boys	30	1.973	0.528	2.113	0.638	2.250	0.637	1.683	0.731	2.005	0.586
Girls	30	2.267	0.502	2.520	0.739	2.390	0.577	2.450	1.065	2.407	0.653
Total	60	2.120	0.532	2.317	0.715	2.320	0.607	2.067	0.985	2.206	0.467
Experimental Total											
Boys	177	2.378	0.813	2.722	1.014	2.369	0.735	2.383	1.115	2.463	0.846
Girls	171	2.624	0.843	3.083	1.051	2.680	0.778	2.925	1.212	2.828	0.890
Total	348	2.499	0.835	2.900	1.046	2.522	0.771	2.649	1.194	2.642	0.886
Total											
Boys	207	2.319	0.790	2.634	0.991	2.352	0.722	2.282	1.095	2.396	0.828
Girls	201	2.571	0.810	2.999	1.029	2.636	0.757	2.854	1.201	2.765	0.870
Total	408	2.443	0.809	2.814	1.025	2.492	0.752	2.563	1.182	2.578	0.868

Table 16

Analysis of Variance on Posttest Average Grade Equivalent Scores in the PLDK Analysis on the Written Language Subtests of the Metropolitan Achievement Test

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
A (PLDK)	3	229.8599	76.6199	6.9511***	2.08
B (Sex)	1	224.8823	224.8823	20.4019***	2.71
A x B interaction	3	43.6243	14.5414	1.3192	2.08
Error	400	4409.0463	11.0226		
Total	407	4907.4228			

***p <.01

Table 17

Analysis of Variance on Posttest Average Grade Equivalent Scores on the Written Language Subtests of the Metropolitan Achievement Test

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	$F_{.90}$
Between					
A (Method of teaching)	2	41.3747	20.6873	7.3014***	2.30
B (PLDK)	2	17.9608	8.9804	3.1695**	2.30
C (Sex)	1	46.6174	46.6174	16.4533***	2.71
A x B	4	20.1984	5.0496	1.7822	1.94
A x C	2	0.4861	0.2430	0.0857	2.30
B x C	2	10.8291	5.4145	1.9110	2.30
A x B x C	4	15.9580	3.9895	1.4080	1.94
Error	330	934.9953	2.8333		
Subtotal	347	1088.4198			
Within=					
D (Subtests)	3	35.7024	11.9008	56.1358***	2.30
A x D	6	5.7678	0.9613	4.5344***	1.77
B x D	6	5.3884	0.8980	4.2358***	1.77
C x D	3	4.2124	1.4041	6.6231***	2.30
A x B x D	12	5.6029	0.4669	2.2023***	1.55
A x C x D	6	0.8255	0.1375	0.6485	1.77
B x C x D	6	0.6382	0.1063	0.5014	1.77
A x B x C x D	12	2.3137	0.1928	0.9094	1.55
Errors	990	209.9557	0.2120		
Subtotal	1044	270.4070			
Total	1391	1358.8268			

*p <.10
**p <.05
***p <.01

years. As expected, girls were significantly higher in achievement than boys (girls = 2.83; boys = 2.46). This superiority of the girls on academic achievement was maintained over all subtests of the MAT.

A significant Method of teaching reading x MAT subtest interaction was obtained. A breakdown of this interaction produced results which, for the most part, confirmed those obtained in the main effects analyses. Generally, the SCRP reading group was significantly superior to both the ITA and WIC groups on all subtests. Only one exception to this result occurred: i.e., the ITA and SCRP groups did not differ significantly on the R subtest. Furthermore, ITA was significantly superior to WIC only on the WK subtest.

A breakdown of the significant PLDK x Subtest interaction also supported the main effects analyses. The presence of this interaction was attributed to the results obtained on the R subtest. On the R subtest, the group without PLDK obtained significantly higher scores than the group which received two years of PLDK. On all other subtests no significant differences were found between the non-PLDK and the two-year PLDK groups (WK, WD, S). Moreover, the difference on the R subtest between the one- and two-year PLDK groups did not reach statistical significance.

The significant Method of teaching reading x PLDK x Subtest interaction generally supported the results discussed previously. That is, on most subtests, the SCRP group was significantly superior to both the WIC and ITA reading groups. The ITA group was superior to the WIC reading group within the two-year PLDK group only on the WK and S subtests. Within the reading groups, PLDK findings generally indicated superior achievement on the part of the non-PLDK group over the one-year PLDK group, except in the case of the WIC reading group. With the WIC reading group, none of the differences between PLDK groups reached statistical significance on any of the MAT subtests. Again, the group with two years of PLDK was generally superior to the one-year PLDK group within the ITA and SCRP reading groups. Only one significant difference was obtained favoring the non-PLDK group in comparison to the two-year PLDK group. This difference was obtained within the SCRP reading group on the R subtest only.

The results from the Metropolitan Achievement Test generally indicate superior achievement on the part of the SCRP reading group when compared to the WIC and ITA reading groups. However, on certain analyses, the ITA reading group achieved significantly higher achievement scores than the WIC group. Thus, it can be concluded that the WIC reading program did not enhance appreciably the academic achievement of these pupils. On PLDK, contrary to prediction, the group which did not receive PLDK obtained significantly higher achievement than the one-year PLDK group. On most comparisons, however, the differences between the non-PLDK and the two-year PLDK group were not significant.

Discussion

The results, following a two year intervention treatment, on each of the areas of development will be discussed below. It should be noted, however, that the final confirmation of these results remains to be obtained on the 1968 follow-up study after the pupils have completed their third grade. Therefore, the following conclusions should be considered tentative.

Intellectual Functioning

Analyses of IQ and MA gains on the Stanford Binet were conducted to evaluate the effects of the experimental treatments. The results on the IQ analyses found that none of the experimental reading and/or language development groups made significantly greater gains than the control group. On MA analyses, the SCRP and WIC reading groups obtained significantly higher MA gains than did the children under the ITA program. Furthermore, among the girls in the SCRP reading group, children receiving one and two years of PLDK made significantly greater gains in comparison to those in the non-PLDK group.

In general, the results on intellectual functioning gave limited support to our prediction that the children receiving oral language stimulation would demonstrate significantly greater gains in intellectual functioning in comparison to those children without language stimulation. Thus, the findings only partially confirmed those obtained in the Cooperative Language Development Project (Dunn, Pochanart, & Pfost, 1967). In the Cooperative Language Development Project, two years of PLDK resulted in greater gains in MA than one year, but neither group was superior to the control group. The superiority in MA gain of the WIC and SCRP groups, in comparison to the children under ITA, was an unexpected finding, perhaps due to pupil and teacher selection factors--rather than the experimental treatments. Thus, these results may be attributable to influence of extra-experimental factors upon the experimental treatments. This question will be examined more thoroughly below (see Interpretation).

Language Abilities

The LA gains for the experimental reading subjects surpassed significantly the increment made by the control group. Within the WIC reading group, the pupils who received two years of PLDK made significantly greater LA gains than the subjects who received no PLDK, or one year of PLDK. In the ITA and SCRP experimental reading groups, the differences between the non-PLDK, one-year PLDK, and two-year PLDK groups did not reach statistical significance. Thus, the prediction that PLDK experience would lead to an increment in linguistic ability, as measured by the ITPA, was given only partial confirmation.

In terms of story telling from pictures on the PLPI, the PLDK groups were significantly superior to both the non-PLDK experimental reading subjects and the control group. Children that received one year of PLDK, however, obtained significantly higher scores than those in the two-year PLDK group. The PLPI results give support to the prediction that oral language stimulation would result in greater gains in language development. However, the prediction that two years of PLDK would result in even greater gains in language development was not confirmed.

The above results give some support to the experimental hypothesis that PLDK experience would facilitate the development of oral language abilities. In the *Cooperative Language Development Project* (Dunn *et al*., 1967) the children who received either one or two years of PLDK made greater gains than the non-PLDK pupils. Moreover, contrary to the results of the present study, two years was more facilitating than one year of PLDK to the development of oral language ability.

School Achievement

The PLDK results on school achievement failed to give unequivocal support to the experimental hypotheses. On the MAT written language subtests, the SCRP reading group was significantly superior to the ITA and WIC groups. Furthermore, both the non-PLDK group and the two-year PLDK group were superior in achievement to the pupils who received one year of PLDK. The non-PLDK group and the two-year PLDK group did not differ appreciably in overall achievement. Thus, while the pupils receiving two years of PLDK were superior to those in the one-year PLDK group, they did not surpass the achievement of the experimental reading subjects who did not receive the treatment. These results are inconsistent with those obtained in the CLDP (Dunn, *et al*., 1967). In the CLDP, children receiving PLDK for two years did better in reading than those receiving no PLDK, or PLDK for one year.

The differences obtained between methods of teaching reading generally found the SCRP method resulted in superior achievement in comparison to the progress made under the ITA and WIC methods, and ITA superior to WIC. The SCRP method differed from the other two experimental reading approaches in two ways. First, the reading materials used in the SCRP did not alter the basic symbol system. Second, the phonetic experience in the SCRP method was more highly organized and concentrated. Therefore, the superiority of the SCRP on academic achievement may support the value of systematic phonic training in traditional orthography with disadvantaged children.

Interpretation

The results following two years of intervention treatment on the *Cooperative Reading Project* displayed a number of inconsistencies. The possibility was entertained that the findings had been confounded by the differential effectiveness among teachers. Consequently, *post hoc* analyses were conducted on the average of the MAT written language subtests to assess this potential source of bias upon both the experimental reading programs and the oral language stimulation treatments. Using the three experimental reading groups (ITA, WIC, and SCRP), an analysis of variance was conducted to assess the variation among teachers within each treatment in contrast to the variation obtained between subjects within each classroom. This analysis found the variability on achievement between teachers within reading programs significantly greater than the variability between the children within each class ($p < .01$). Moreover, within the PLDK treatments, the variability between teachers' achievement was also significantly greater than the differences obtained between the children within each classroom ($p < .01$). In contrast to the findings of the reading analysis, the differences between the PLDK treatments did not exceed significantly the variability found among teachers within groups.

The findings of the above analyses illustrate that differential teacher effectiveness served to minimize the effects of the experimental treatments. Bond and Dykstra (1967), in summarizing the results of 27 research studies of first grade reading instruction, have found that the variability among classes within teaching methods to be greater than the differences obtained among methods. In an earlier first grade study, Sexton and Herron (1928) found the differences between phonic and non-phonic groups were less than the difference obtained between groups having different teachers. Sexton and Herron concluded that a good teacher invariably produced good readers, with or without phonic instruction. Thus, the presence of substantive differences in teacher effectiveness in this study may have precluded an adequate test of the effects of the experimental treatments upon the intellectual, linguistic, and academic development of disadvantaged children.

Confounding the factor of teacher effectiveness with the results of the experimental treatments may provide some explanation for the poor performance of the one-year PLDK group. During the second year of the project, changes in teacher personnel occurred in both the ITA and SCRP, one-year PLDK, groups. Further analyses revealed that the classes of these teachers had lower average MAT scores than both the other two teachers in their reading groups and the average of all other one-year PLDK teachers. Since the numbers involved in these comparisons were small, the differences were not tested for statistical significance.

In summary, some of the analyses reported in this chapter supported the experimental hypotheses. Many of the results, however, either failed to support our expectations, or were equivocable. *Post hoc* analyses revealed the presence of significant differences among the MAT achievement performance of the classes within each of the treatment groups. Thus, the presence of substantial differences among the achievement levels of different classrooms may have obscured the existence of differences between treatments. Finally, the presence of Hawthorne effect, the possible insensitivity of the criterion tests as measures of treatment effects, and the inability of the treatments to change appreciably the psychological characteristics and achievement of disadvantaged children must be entertained as potential explanations for the above results.

CHAPTER IV

INFORMAL EVALUATION

This chapter presents an overview of the reactions of the teachers to the experimental program. Each teacher was asked to write a short report at the end of the school year containing general observations about her class, the experimental method or methods employed, the progress of her pupils, and the impact of the program upon her as a teacher. The following was drawn from these reports.

General Observations

Most of the teachers considered their classroom adequate in size, ventilation, lighting, and equipment. Generally, the rooms were considered conducive to learning. Some teachers, however, registered dissatisfaction over the level of noise outside their classrooms. A few teachers had to contend with excessive noise from adjacent playgrounds during certain portions of the day. One teacher's classroom was located in close proximity to a major trucking firm, and the noise from this source was reported to be particularly disruptive.

The teachers' comments about their children were especially instructive. The teachers uniformly described their pupils as coming from impoverished circumstances. The reported socioeconomic status of the children was very low. Many families were on welfare, and subsisting on incomes of less than $3,000. The housing conditions of their families were rated as poor. Moreover, in many families, either both parents worked or the father was reported as absent. Thus, the parental guidance and attention received by the children was minimal. In short, most of the children came from cultural circumstances which possessed the negative and debilitating attributes of slum living.

The pervasive effects of this poor cultural milieu upon the children's behavioral and learning characteristics were quite apparent. Readiness tests administered at the beginning of the project classified many children as poor risks for learning to read. There was a scattering of children who had some kindergarten experience, but this was the exception rather than the rule. Some pupils had repeated the first grade, while many others were reported as being too immature for the work required either in the first or second grades. Besides general immaturity, the teachers stated that many of their pupils had emotional problems, language deficiencies, poor motivation, speech defects, and poor concentration.

The majority of classrooms accommodated between 25 and 30 pupils. One notable exception, during the first year, was a classroom in the

SCRP treatment which had 45 students. The teacher was provided an aide in order to make the adult-pupil contact across conditions more equitable. Two classes during the 1966-67 school year began with 38 and 39 pupils, respectively. Around the middle of the year, these classes were reduced in size, making them consistent in size with most of the other experimental classes.

Experimental Methods of Teaching Reading

The teachers reported using many supplementary materials besides their basic reading materials in working with the pupils. Many of these materials were made by the teachers, while some were prepared commercially. A sampling of these materials included children's story books, films, film strips, phonic and word games, specially prepared charts, and audio listening centers. These activities were instituted principally to develop readiness for reading. This instructional emphasis resulted from the need of the project children for extensive readiness activities to facilitate the development of reading skills.

Most of the teachers spent about 90 minutes per day in the teaching of reading. Typically, reading instruction was given to small groups of six to eight pupils, classified according to reading ability. In most cases, an effort was made to correlate reading instruction with spelling and writing exercises. Extensive use was also made of a buddy system which paired good reading with a poor reading pupil.

The ITA teachers felt that the basic materials were excellent, the stories were interesting, the alphabet furnished a one-to-one correspondence between sound and symbol, and that the lack of capital letters helped the children in learning to read. They found the Downing Readers and ITA library books helpful as supplementary reading materials. Furthermore, the teachers favorably evaluated the Lippincott basal reading series. Generally, the ITA program was well accepted by both teachers and pupils. The teachers and the staff consultant considered it a particularly good program for disadvantaged children. The enthusiasm expressed by the ITA teachers was high.

The SCRP teachers made extensive use of supplementary reading materials. In the early months of the first grade, the teachers had planned to use the readiness book from the Houghton Mifflin program, but the material did not arrive until late October. Consequently, all teachers began with the Reading with Phonics materials. The teachers also had to resolve some inconsistency between the two programs, notably, that in the Reading for Meaning program, the consonants are introduced first, while the short vowel sounds are taught first in the Reading with Phonics program. This difficulty in correlating the Reading with Phonics material with the Houghton Mifflin program was reported by most teachers. In general, the SCRP teachers considered the program an excellent approach to the teaching of reading. The teachers noted that their pupils demonstrated marked growth in the development of word attack skills and reading comprehension. Finally, student interest was reported as high.

The WIC teachers generally experienced great difficulty with their materials. They felt that the worksheets were too small, and that the pupil books and word building materials were too difficult. Furthermore, the teachers reported that the manual was not clear, and that the materials were poorly correlated with the reading program. While the manual states that most children should complete the WIC program in about 12 weeks, most teachers were seeing little progress as late as January of the first year. At this time a consultant from the publisher worked with them to help guide them into other materials. Even though the WIC approach was replaced later by the Reading for Meaning program, some Lippincott readers were placed in the classrooms of the first year during the spring as supplementary materials. Generally, the WIC teachers felt that they had to improvise many materials in order to implement the program. Progress in the development of word attack skills, however, was noted in many pupils. Some teachers felt the WIC program made an excellent supplement to a basal reading program, but considered it inadequate as a substitute. One teacher felt the approach was excellent for slow learning children. In short, while some pupil progress was noted as a result of the WIC reading approach, the morale of both teachers and pupils was lower than that found in the ITA and SCRP groups.

Peabody Language Development Program

At the beginning of the project, six teachers in each of the experimental reading treatments used the oral language stimulation materials. Half of these teachers continued the PLDK program during the second year. The response of these teachers was comparable to the ones who used the experimental edition in a previous study. Dunn and Mueller (1966) reported positive feelings by teachers who used the program to develop oral language abilities.

The PLDK lessons were taught to the total class for approximately 30 to 45 minutes each day. The teachers reported gains by their pupils in oral expression, vocabulary, enunciation, concentration, and school achievement. The teachers felt the program was especially helpful in developing oral expression, in refining speech patterns, and changing the pupil's speech from dull and monosyllabic words to lively and interesting discourse. Since most children came from homes where they had had little opportunity for oral communication with their parents, these reports were considered particularly encouraging. Several teachers commented on the effect of the PLDK in promoting group cohesiveness and a sense of belonging, especially with many of the shy and immature children. It was felt that the language materials complemented the reading programs, and provided many readiness activities which were badly needed. The teachers considered the lessons to be uniquely suited to the special needs of deprived children in that they accommodated wide individual differences in abilities, while also giving the children opportunities for success experiences.

A few criticisms of the program were noted. Certain teachers felt some of the lessons were too long and that the instructions, in some instances, were not clear enough. Moreover, one teacher felt that the lessons should have been more informationally oriented.

Children's Responses to Experimental Treatments

The teachers felt that pupil interest had been high under the experimental programs. Improvements in oral expression, word attack skills, and reading comprehension were frequently cited. According to the teachers, the student growth appeared to be greater under the ITA and SCRP treatments, particularly in combination with the oral language stimulation program. Progress under the WIC program appeared to be less marked. Finally, the pupils in the ITA reading program encountered little difficulty in making the transition to TO.

Impact on the Teachers

The impact of the experimental treatments upon the teachers was most apparent from their attitude toward future use of the materials. The majority of the teachers expressed the desire to utilize their approach after the completion of the experimental study. Others wanted to use them with certain modifications and adaptations. Generally, the teachers felt that it had been a profitable experience for them; they had grown in their understanding of the processes needed in teaching reading; they felt they could do a better job of discovering their children's instructional needs; and they were more perceptive to the needs of disadvantaged youngsters. Several teachers, who taught both the oral language lessons and an experimental reading approach, felt that they tried to implement too many new things, and that this placed an inordinate amount of pressure on them.

Summary

This discussion of the teacher's reports has attempted to present some of their feelings toward the total experimental program. No attempt had been made to list all comments, whether strengths or weaknesses, but only to present a general flavor of the reactions that were representative of the 25 teacher reports.

The oral language development lessons were seen as advantageous for numerous reasons. The experimental reading approaches were looked upon favorably. The WIC teachers, however, seemed to encounter great difficulty in implementing their program. The children's progress varied considerably. Many made at least adequate progress, while some showed little growth. The teachers felt that it had been an experience in which they had grown both in teaching skills and in their understanding of disadvantaged children.

CHAPTER V

SUMMARY AND CONCLUSIONS

There is ample evidence to indicate that disadvantaged children enter school with many deficits in comparison to children from more favorable environments, and that these deficits lead to progressive retardation as they move through the schools. This "cumulative deficit" is especially evident in the area of oral and written language. Therefore, today's schools are faced with the challenge of developing improved methods of teaching the disadvantaged in these skills. The Cooperative Reading Project was aimed at finding evidence for meeting this challenge.

The Cooperative Reading Project is an outgrowth of an earlier study, the Cooperative Language Development Project. The Cooperative Language Development Project examined the efficacy of the Initial Teaching Alphabet as an approach to beginning reading, and the Peabody Language Development Kits in stimulating oral language and reading achievement, with disadvantaged children. The early findings from this study indicated significant growth for children using these materials in contrast to the regular school program. The following question concerning these results remained: Were the ITA and PLDK superior due to the materials themselves, or due to the extra incentives provided the experimental teachers, or to some combination of the two, or due to some other factor or factors such as pupil and/or teacher selection?

Purpose

The central purpose of the Cooperative Reading Project was to examine, with teacher incentives and support comparable, the relative effectiveness of three approaches to the teaching of beginning reading, and the influence of an oral language stimulation program on the development of disadvantaged children through their first two years in school. This monograph reports on the final year of the project.

The three experimental reading treatments were: (1) the Initial Teaching Alphabet (ITA), (2) the Words In Color (WIC) program, and (3) a Supplemented Conventional Reading Program (SCRP) which used a basic reader plus additional phonics material. Each of the experimental reading approaches is based on the belief that the child should learn certain sound-symbol relationships before beginning to read. Therefore, the treatments would be toward the synthetic end of a continuum running from analytic to synthetic. The SCRP most nearly paralleled the typical basal reader approach. In addition to the reading treatments, some of the experimental classes received an oral stimulation program in the first year utilizing Level #1 of the Peabody Language Development Kits

(PLDK). During the second year (1966-67), some of the children received Level #2 of the Peabody Language Development Kits. It was predicted that: (1) children learning to read through any and all of the three experimental reading approaches would show significantly greater achievement gains than would children learning to read in a standard primary grade program, (2) children receiving the oral language stimulation exercises in addition to the experimental reading program would show significantly greater gains in oral language, verbal intelligence, and school achievement than would children receiving no oral language stimulation, and (3) children receiving two years of oral stimulation would show significantly greater gains than those children receiving oral language stimulation for only one year.

Subjects

A total of 538 subjects -- 473 in the combined experimental groups and 65 controls -- from 12 public elementary schools in an inner-city area constituted the subject pool. Since the treatments were administered to all children in a classroom the treatment groups were neither equal in number nor on certain other important variables. Therefore, a selected sample, in which subjects who did not meet specified sampling criteria were deleted (see Chapter III), was drawn from this subject pool. This resulted in a selected sample of 408 subjects (207 boys and 201 girls) on which data were analyzed.

The effectiveness of the program was evaluated by means of the Metropolitan Achievement Test, the Illinois Test of Psycholinguistic Abilities, the Peabody Language Production Inventory, and the Stanford-Binet Intelligence Scale. The pretesting was done at the outset of the 1965-66 school year, and the posttesting during the last one and one-half months of the 1966-67 school year -- at the end of the two-year experimental period.

Procedures

Nine experimental treatment groups and a control group were established. Each of the nine treatments consisted of three teachers who were committed to keeping their pupils through both of the first two grades. Group 1 was to use ITA followed by the Lippincott basic reader without PLDK. Group 2 was to use ITA followed by the Lippincott basic reader, plus one year of PLDK. Group 3 was to use ITA followed by the Lippincott basic reader, plus two years of PLDK. Group 4 was to use WIC followed by the Houghton Mifflin basal reader without PLDK. Group 5 was to use WIC followed by the Houghton Mifflin basal reader, plus one year of PLDK. Group 6 was to use WIC followed by the Houghton Mifflin basal reader, plus two years of PLDK. Group 7 was to use the SCRP (the Houghton Mifflin basal reader supplemented by the Hay-Wingo phonics materials) without PLDK. Group 8 was to use the SCRP, plus one year of PLDK. Group 9 was to use the SCRP, plus two years of PLDK. Group 10 was the control group.* The teachers and pupils in the control group were not involved in any of the experimental treatments or incentives. They were only visited during the year for pretesting and posttesting. The experimental treatments had a consultant who visited each class regularly, and conducted the in-service meetings. The experimental teachers received a small annual $300 stipend for the extra time given to the project. Supplementary materials were furnished for all experimental classes with approximately $30 spent on reading materials in each class.

Results

The primary statistical procedure involved analyses of variance to compare experimental and control groups, with t-tests to detect differences between subgroups within the experimental treatments. Since this was an intervention study, the .90 level of confidence was used to evaluate the statistical significance of all treatment differences.

The following results were obtained:

(1) On intellectual functioning, no significant IQ differences were obtained between PLDK and non-PLDK children, or between the experimental reading groups. However, children in the SCRP and WIC reading groups obtained significantly greater MA gains than children in the ITA group. Among girls in the SCRP reading group, both the one- and two-year PLDK groups surpassed the non-PLDK experimental reading groups on MA gains.

(2) The SCRP pupils made significantly higher LA gains on the ITPA than the pupils in either the ITA or WIC reading groups. Within the WIC group, the children with two years of PLDK made significantly higher LA gains than the non-PLDK and one-year PLDK groups. But no significant difference was found between the non-PLDK and PLDK treatment groups -- overall.

(3) On a measure of free, connected, speech (PLPI), children who received one- and two-years of PLDK obtained significantly higher scores than either the controls or the non-PLDK experimental

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* Many of the controls were drawn from the only elementary school in the area accredited by the Southern Association of Colleges and Schools. It is possible that the experimental treatments could be expected to do little more than equalize conditions.

reading subjects. However, children receiving one year of PLDK obtained significantly higher scores in comparison to those in the two-year PLDK group.

(4) On written language achievement, children in the SCRP group obtained significantly higher scores than those in the ITA and WIC reading groups. The ITA children surpassed those in the WIC group, due in large measure to the R subtest of the MAT. On PLDK, the experimental reading subjects who did not receive PLDK were superior to the one-year PLDK group. The non-PLDK and two-year PLDK groups did not differ significantly on achievement, except on the R subtest. (The non-PLDK children surpassed those with two years of PLDK on the R subtest.)

Conclusion

The results following two years of experimental reading and language treatment gave only partial confirmation to the experimental hypotheses. On some comparisons, PLDK experience facilitated the development of linguistic skills. However, experience with PLDK did not appear to generalize to the area of academic achievement and intellectual development.

On the reading dimension, the SCRP group was significantly superior to the ITA and WIC reading groups on written language achievement. Moreover, there was some tendency for the ITA group to be superior to the WIC group. Since the SCRP group received the most systematic phonic training program, the experimental reading results appear to indicate that the inclusion of systematic training in these skills complements the materials of the basal reading programs.

A number of alternate explanations may account for the experimental results. First, great variability on academic achievement was found among classes within the experimental treatments. Thus, the presence of differential effectiveness between teachers may have operated to reduce the potential effects of the experimental treatments. Second, the differences found between the experimental and control pupils were generally greater than the differences obtained among the experimental treatments. This rather consistent finding underlines the contribution of the Hawthorne effect to the results of the intervention treatments. Finally, even though a number of statistically significant results were obtained, many of the differences or gains were minimal. (For example, the differences obtained on the variable of academic achievement rarely exceeded .6 of a grade level.)

In summary, the results of this two year intervention gave only partial confirmation to the experimental hypotheses. Significant differences favoring the PLDK language intervention were found with one experimental group in both the LA and MA comparisons. In addition, the PLDK experience had a salutary effect upon the development of free, connected, speech, as measured by the PLPI. Pupils in the SCRP reading group were superior on written language achievement in comparison to the ITA and WIC groups. The experimental reading results seem to support the inclusion of systematic phonic instruction in traditional orthography for disadvantaged children. Finally, it is felt that both the influence of the Hawthorne effect and differential effectiveness among teachers operated to reduce the influence of the experimental treatments upon pupil growth. It is incumbent upon future efforts in intervention research to control systematically for the influences of these particular sources of variance.

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Appendix A

Summary of Basic Data by Treatment Group

Table I-A

Summary of Basic Data by Treatment Group

Treatment Group		CA	SB-IQ			SB-MA		
			Pre	Int	Post	Pre	Int	Post
ITA W/O								
Boys	N	24	24	24	24	24	24	24
	$\bar{X}$	73.71	91.58	98.92	94.79	67.29	82.00	90.58
	S	3.77	15.12	12.66	14.51	12.36	10.16	13.77
Girls	N	28	28	28	28	28	28	28
	$\bar{X}$	74.54	87.79	92.29	89.11	66.21	77.36	86.14
	S	4.33	10.73	10.26	12.93	7.49	8.84	12.11
Total	N	52	52	52	52	52	52	52
	$\bar{X}$	74.15	89.54	95.35	91.73	66.71	79.50	88.19
	S	4.07	12.95	11.80	13.84	9.94	9.66	12.97
ITA W/1								
Boys	N	27	27	27	27	27	27	27
	$\bar{X}$	75.19	86.00	88.30	86.07	65.15	74.67	83.74
	S	5.05	13.96	15.22	14.54	8.10	10.75	11.86
Girls	N	24	24	23	24	24	23	24
	$\bar{X}$	71.21	86.96	88.83	86.67	65.17	74.61	83.12
	S	15.74	13.95	15.05	14.93	8.63	12.21	13.81
Total	N	51	51	50	51	51	50	51
	$\bar{X}$	73.31	86.45	88.54	86.35	65.16	74.64	83.45
	S	11.46	13.82	14.99	14.58	8.27	11.32	12.69
ITA W/2								
Boys	N	27	27	26	27	27	26	27
	$\bar{X}$	73.74	87.74	87.35	88.07	65.30	73.19	83.93
	S	4.63	11.64	14.38	17.34	8.57	11.65	16.42
Girls	N	26	26	26	26	26	26	26
	$\bar{X}$	72.54	87.73	86.38	91.85	64.38	71.31	86.77
	S	3.290	10.13	9.96	15.84	6.41	7.27	13.25
Total	N	53	53	52	53	53	52	53
	$\bar{X}$	73.15	87.74	86.87	89.92	64.85	72.25	85.32
	S	4.04	10.82	12.26	16.57	7.53	9.66	14.87
WIC W/O	N	31	31	29	31	31	29	31
Boys	$\bar{X}$	73.58	87.10	84.14	87.87	65.00	71.24	84.81
	S	3.57	13.16	12.60	14.06	9.45	10.78	13.49
Girls	N	30	30	30	30	30	30	30
	$\bar{X}$	73.70	86.30	86.03	88.23	64.47	72.23	84.97
	S	3.64	13.99	12.26	15.51	9.74	8.78	13.37
Total	N	61	61	59	61	61	59	61
	$\bar{X}$	73.64	86.70	85.10	88.05	64.74	71.75	84.89
	S	3.57	13.47	12.36	14.67	9.52	9.74	13.32

-continued

Table I-A (continued)

WIC W/1								
Boys	N	26	26	24	26	26	24	26
	$\bar{X}$	73.50	87.42	93.04	90.19	65.19	78.50	86.88
	S	3.94	12.98	15.55	17.93	9.90	13.39	15.93
Girls	N	20	20	19	20	20	19	20
	$\bar{X}$	72.55	92.20	95.05	95.25	66.80	78.26	89.85
	S	2.44	12.42	15.24	14.61	7.94	10.73	12.43
Total	N	46	46	43	46	46	43	46
	$\bar{X}$	73.09	89.50	93.93	92.39	65.89	78.40	88.17
	S	3.37	12.83	15.26	16.59	9.04	12.15	14.44
WIC W/2								
Boys	N	28	28	27	28	28	27	28
	$\bar{X}$	73.79	90.79	91.33	92.71	67.61	76.59	89.36
	S	4.72	13.58	18.68	16.17	10.14	13.87	14.55
Girls	N	39	39	38	39	39	38	39
	$\bar{X}$	73.85	84.79	86.45	89.49	61.59	72.55	85.56
	S	4.56	15.04	13.83	14.41	17.02	9.90	12.93
Total	N	67	67	65	67	67	65	67
	$\bar{X}$	73.82	87.30	88.48	90.84	64.10	74.23	87.15
	S	4.59	14.65	16.07	15.13	14.75	11.78	13.65
SCRP W/O								
Boys	N	30	30	28	30	30	28	30
	$\bar{X}$	75.33	90.80	89.18	93.27	68.67	75.89	90.67
	S	4.74	16.82	14.87	17.66	10.32	11.07	14.42
Girls	N	18	18	16	18	18	16	18
	$\bar{X}$	75.89	91.39	93.38	87.83	69.72	78.38	84.22
	S	5.54	12.88	15.90	15.16	8.31	11.83	13.99
Total	N	48	48	44	48	48	44	48
	$\bar{X}$	75.54	91.02	90.70	91.23	69.06	76.80	88.25
	S	5.00	15.32	15.21	16.81	9.54	11.28	14.46
SCRP W/1								
Boys	N	28	28	27	28	28	27	28
	$\bar{X}$	75.36	87.11	88.74	88.71	66.39	75.93	86.04
	S	5.44	14.18	12.28	14.67	10.83	9.22	13.37
Girls	N	20	20	19	20	20	19	20
	$\bar{X}$	73.75	88.90	92.05	94.45	66.00	76.58	89.80
	S	5.08	9.84	11.10	10.98	5.21	8.45	9.18
Total	N	48	48	46	48	48	46	48
	$\bar{X}$	74.69	87.85	90.11	91.10	66.23	76.20	87.60
	S	5.30	12.47	11.79	13.43	8.86	8.94	11.84
SCRP W/2								
Boys	N	28	28	21	28	28	21	28
	$\bar{X}$	75.00	92.21	98.90	98.25	69.54	84.24	95.43
	S	4.85	10.88	12.24	15.64	7.90	14.23	14.44
Girls	N	19	19	18	19	19	18	19
	$\bar{X}$	75.32	80.21	89.44	86.05	61.42	75.06	83.42
	S	6.54	10.77	14.98	15.52	6.14	10.88	12.43
Total	N	47	47	39	47	47	39	47
	$\bar{X}$	75.13	87.36	94.54	93.32	66.26	80.00	90.57
	S	5.53	12.26	14.21	16.56	8.22	13.45	14.78

-continued

Table I-A (continued)

Control								
Boys	N	35	35	31	35	35	31	35
	$\bar{X}$	73.83	84.37	85.42	88.34	63.29	71.90	84.46
	S	4.40	10.44	8.40	16.75	7.01	7.35	12.36
Girls	N	30	30	27	30	30	27	30
	$\bar{X}$	72.83	86.67	86.59	85.57	63.67	72.22	80.70
	S	3.64	10.22	10.33	11.00	6.74	7.80	9.62
Total	N	65	65	58	65	65	58	65
	$\bar{X}$	73.37	85.43	85.97	87.06	63.46	72.05	82.72
	S	4.07	10.32	9.28	14.35	6.84	7.50	11.26
Grand Total	N	284	284	264	284	284	264	284
Boys	$\bar{X}$	74.30	88.39	90.10	90.80	66.30	76.05	87.49
	S	4.54	13.37	14.43	15.75	9.32	11.73	14.31
Girls	N	254	254	244	254	254	244	254
	$\bar{X}$	73.55	87.06	89.08	89.28	64.63	74.41	85.29
	S	6.38	12.45	12.97	14.22	9.77	9.76	12.47
TOTAL	N	538	538	508	538	538	508	538
	$\bar{X}$	73.95	87.76	89.61	90.08	65.50	75.27	86.45
	S	5.50	12.95	13.74	15.05	9.66	10.85	13.51

Table I-B

Summary of Basic Data by Treatment Group

Treatment Group		LA			PLPI	MAT				
		Pre	Int	Post		WK	WD	R	S	A
ITA W/O										
Boys	N	24	24	24	23	24	24	24	24	24
	$\overline{X}$	66.17	73.79	82.58	65.39	2.371	2.700	2.517	2.200	2.457
	S	8.76	9.04	12.68	7.49	.850	.970	.810	1.111	.907
Girls	N	28	28	28	28	28	28	28	28	28
	$\overline{X}$	63.36	69.50	79.36	70.93	2.925	3.357	2.993	3.104	3.094
	S	7.72	7.96	12.52	5.97	.810	1.153	1.047	1.265	1.019
Total	N	52	52	52	51	52	52	52	52	52
	$\overline{X}$	64.65	71.48	80.85	68.43	2.669	3.054	2.773	2.706	2.800
	S	8.25	8.66	12.58	7.19	.912	1.113	1.001	1.227	1.012
ITA W/1										
Boys	N	27	27	27	26	27	27	27	27	27
	$\overline{X}$	60.93	73.30	80.59	76.27	2.218	2.430	2.311	2.218	2.294
	S	10.95	8.40	12.29	8.28	.710	.960	.721	1.238	.814
Girls	N	24	21	24	22	24	24	24	24	24
	$\overline{X}$	60.46	70.24	78.58	73.54	2.192	2.525	2.421	2.479	2.404
	S	7.85	9.59	13.84	10.96	.728	1.196	.817	1.455	1.012
Total	N	51	48	51	48	51	51	51	51	51
	$\overline{X}$	60.71	71.96	79.65	75.02	2.206	2.474	2.363	2.341	2.346
	S	9.53	8.98	12.95	9.60	.711	1.067	.762	1.337	.904
ITA W/2										
Boys	N	27	27	27	27	27	27	27	27	27
	$\overline{X}$	59.30	69.04	79.59	73.33	2.730	3.030	2.574	2.692	2.756
	S	10.24	10.36	11.76	11.52	1.167	1.149	.890	1.079	.910
Girls	N	26	25	26	26	26	26	26	26	26
	$\overline{X}$	63.23	68.24	78.88	69.73	2.985	3.308	2.646	3.119	3.014
	S	7.57	6.02	10.83	1.03	1.022	1.055	.823	1.161	.907

- continued

Table I-B (continued)

ITA W/2										
Total	N	53	52	53	53	53	53	53	53	53
	X	61.23	68.65	79.25	71.57	2.855	3.166	2.609	2.902	2.883
	S	9.16	8.49	11.21	11.32	1.095	1.102	.850	1.130	.955
WIC W/O										
Boys	N	31	30	31	31	31	31	31	31	31
	X	61.29	67.67	78.48	69.35	2.152	2.458	2.245	2.026	2.220
	S	11.61	12.95	14.87	12.64	.554	.861	.586	.895	.676
Girls	N	30	30	30	30	30	30	30	30	30
	X	62.03	69.90	77.33	68.20	2.550	3.010	2.740	2.91	2.802
	S	9.95	11.73	13.18	14.53	.836	1.100	.940	1.248	.972
Total	N	61	60	61	61	61	61	61	61	61
	X	61.66	68.78	77.92	68.79	2.348	2.730	2.488	2.461	2.506
	S	10.74	12.30	13.96	13.50	.729	1.017	.813	1.163	.879
WIC W/1										
Boys	N	26	25	26	26	26	26	26	26	26
	X	63.62	76.12	80.58	73.04	2.388	2.554	2.254	2.238	2.359
	S	8.26	11.49	12.84	10.99	.918	1.076	.895	1.196	.979
Girls	N	20	18	20	20	20	20	20	20	20
	X	66.75	77.00	81.10	77.65	2.830	3.210	2.975	2.995	3.002
	S	7.50	7.90	9.74	8.15	.976	.994	.888	1.138	.929
Total	N	46	43	46	46	46	46	46	46	46
	X	64.98	76.49	80.80	75.04	2.580	2.839	2.567	2.567	2.638
	S	8.01	10.04	11.48	10.02	.959	1.081	.953	1.218	1.001
WIC W/2	N	28	27	28	27	28	28	28	28	28
Boys	X	65.39	75.59	86.36	69.70	2.393	2.857	2.507	2.550	2.577
	S	14.07	10.31	12.68	9.08	1.016	1.283	1.087	1.213	1.079
Girls	N	39	37	39	38	39	39	39	39	39
	X	60.95	72.32	78.92	70.84	2.23	2.679	2.315	2.256	2.370
	S	11.39	9.69	12.77	8.30	.637	1.070	.717	1.079	.824
Total	N	67	64	67	65	67	67	67	67	67
	X	62.81	73.70	82.03	70.37	2.297	2.754	2.396	2.379	2.456
	S	12.67	10.01	13.16	8.58	.814	1.158	.888	1.138	.937

-continued

Table I-B (continued)

SCRP W/O										
Boys	N	30	29	30	30	30	30	30	30	30
	$\overline{X}$	63.70	72.97	84.67	66.00	2.727	3.187	2.840	3.040	2.948
	S	10.93	9.98	11.73	6.93	1.040	1.167	1.064	1.304	1.096
Girls	N	18	17	18	17	18	18	18	18	18
	$\overline{X}$	63.94	73.94	83.89	65.65	3.122	3.606	3.111	3.483	3.330
	S	7.83	10.74	13.21	7.64	.975	1.075	.878	1.279	.996
Total	N	48	46	48	47	48	48	48	48	48
	$\overline{X}$	63.79	73.33	84.38	65.87	2.875	3.344	2.942	3.206	3.092
	S	9.79	10.16	12.17	7.12	1.028	1.140	.998	1.210	1.065
SCRP W/1										
Boys	N	28	26	28	26	28	28	28	28	28
	$\overline{X}$	62.25	72.12	81.46	70.15	2.414	2.657	2.304	2.296	2.418
	S	10.71	9.36	11.07	9.24	.965	1.070	.765	1.317	.976
Girls	N	20	20	20	20	20	20	20	20	20
	$\overline{X}$	64.15	74.00	85.30	71.20	2.925	3.190	2.835	3.100	3.012
	S	6.79	6.27	10.47	6.84	.941	.926	.607	1.284	.864
Total	N	48	46	48	46	48	48	48	48	48
	$\overline{X}$	63.04	72.93	83.06	70.61	2.627	2.879	2.525	2.631	2.666
	S	9.24	8.14	10.88	8.21	.978	1.037	.745	1.350	.968
SCRP W/2	N	28	26	28	27	28	28	28	28	28
Boys	$\overline{X}$	64.32	78.96	86.64	69.85	2.79	3.382	2.475	3.132	2.944
	S	8.79	10.81	13.08	8.45	.557	.686	.487	.964	.558
Girls	N	19	18	19	18	19	19	19	19	19
	$\overline{X}$	59.05	70.83	78.84	70.28	2.46	3.047	2.453	3.242	2.801
	S	9.17	9.22	10.87	6.29	.616	.931	.455	1.077	.686
Total	N	47	44	47	45	47	47	47	47	47
	$\overline{X}$	62.19	75.63	83.49	70.02	2.657	3.247	2.466	3.176	2.887
	S	9.23	10.85	12.72	7.58	.597	.802	.470	1.001	.610
Control										
Boys	N	35	30	35	35	35	35	35	35	35
	$\overline{X}$	61.23	70.50	78.60	66.11	2.051	2.234	2.306	1.811	2.101
	S	6.61	9.78	10.53	9.64	.560	.745	.664	.816	.637

- continued

Table I-B (continued)

Control										
Girls	N	30	28	30	30	30	30	30	30	30
	$\bar{X}$	61.40	69.68	75.33	69.87	2.267	2.520	2.390	2.450	2.407
	S	6.31	7.03	8.47	14.26	.502	.739	.577	1.176	.653
Total	N	65	58	65	65	65	65	65	65	65
	$\bar{X}$	61.31	70.10	77.09	67.85	2.151	2.366	2.345	2.106	2.242
	S	6.42	8.50	9.70	12.04	.541	.750	.622	1.040	.658
Grand Total										
Boys	N	284	271	284	278	284	284	284	284	284
	$\bar{X}$	62.74	72.87	81.87	69.79	2.414	2.738	2.431	2.413	2.499
	S	10.29	10.68	12.53	10.05	.875	1.052	.828	1.169	.916
Girls	N	254	242	254	249	254	254	254	254	254
	$\bar{X}$	62.36	71.28	79.34	70.72	2.605	2.999	2.652	2.844	2.775
	S	8.63	9.02	11.87	10.37	.865	1.074	.830	1.253	.931
TOTAL	N	538	513	538	527	538	538	538	538	538
	$\bar{X}$	62.56	72.12	80.68	70.23	2.504	2.862	2.536	2.617	2.630
	S	9.54	9.96	12.28	10.20	.875	1.069	.836	1.227	.933

Table II

Rank Order of Time Scheduled to Teach Formal Reading During the First Year for All Teachers in the Cooperative Reading Project

Time	Treatment	Time	Treatment
75	WIC	90	Control
75	WIC plus PLDK	90	Control
75	WIC plus PLDK		
75	WIC plus PLDK	95	SCRP plus PLDK
80	WIC plus PLDK	105	WIC plus PLDK
		105	Control
85	WIC plus PLDK	105	Control
90	ITA	120	WIC
90	ITA	120	WIC plus PLDK
90	ITA	120	SCRP
90	ITA plus PLDK	120	SCRP plus PLDK
90	ITA plus PLDK	120	SCRP plus PLDK
90	ITA plus PLDK	120	Control
90	ITA plus PLDK	120	Control
90	ITA plus PLDK	120	Control
90	WIC	120	Control
90	SCRP	120	Control
90	SCRP plus PLDK	120	Control
90	SCRP plus PLDK	120	Control
90	SCRP plus PLDK		
90	Control	145	SCRP

Appendix B

Teacher Rating Schedule, Peabody Cultural Opportunity Screening Scale, and an Outline for the Teacher's Annual Report

COOPERATIVE READING PROGRAM
Teacher Rating Schedule

Teacher ______________ School ________________

Approach ______________ Observer ______________ Date __________

Time: Observation began __________ ended ____________

1. Overall Rating

poor	fair	satisfactory	good	excellent

Comments:

2. Classroom Control--Psychological

chaotic	disorderly	supportive	fairly inflexible	authoritarian

Comments:

3. Classroom Control--Instructional (appropriate use of time)
(Purposeful independent activities)

very few children	some children	about half the children	most children	all children

Comments:

Teacher Rating Schedule (continued)

4. Reading Instruction

poor	fair	satisfactory	good	excellent

Comments:

5. Instructional Level

too easy		appropriate		too difficult

Comments:

6. Lesson Objectives

obscure		fairly clear		clear

Comments:

7. Pupil Materials Used: (List)

8. Teacher Materials Used: (List)

9. Non-approach Materials Observed:

Teacher Rating Schedule (continued)

10. Pupil motivation and interest in the reading program

poor	fair	satisfactory	good	excellent

Comments:

11. Teacher motivation and interest in the reading program

poor	fair	satisfactory	good	excellent

Comments;

PEABODY CULTURAL OPPORTUNITY SCREENING SCALE 65-66 Rev.

GUIDELINES

I. Housing Conditions: check the one item which best describes the dwelling unit in which the child resides.

II. Child Rearing

A. 1. Responsibility: check the one item which best describes the person who is in charge of raising the child. If this person holds some other relationship to the child than those offered (e.g. foster mother, father) specify that relationship.

2. Age: check the age range within which II.A.1. falls.

3. Education: circle the number indicating the highest grade completed by II.A.1. Numbers 1, 2, 3 and 4 following the (u) indicate the number of undergraduate years completed and 1, 2, and 3 after the (g) indicate the graduate years.

4. Employment: check both whether II.A.1. works outside the home and the item which best describes the number of days II.A.1. is engaged in such employment during the week.

B. 1. Father: check the one person who acts as the male surrogate to the child. If this person falls in some category not listed, specify their relationship to the child (e.g. friend, uncle).

III. General Family Information

A. 1. Number of persons: circle the total number of adults and children, including the pupil, who reside in the same dwelling unit as the child.

B. 1. Number of rooms: circle the number of rooms which make up the living quarters of the dwelling unit in which the child lives, remembering to exclude halls, closets, ect.

C. 1. Education: circle the number indicating the highest grade completed by III.A.1.

2. Relationship: check the item which gives the relationship of III.C.1. to the child. If this person holds some other relationship to the child than those offered (e.g. grandmother, friend) specify that relationship.

IV. Family Income

A. 1. Welfare: if the family has received any public assistance in the last year, check ______yes.

Peabody Cultural Opportunity Screening Scale (continued)

B. 1. Combined gross annual income: check the range within which the sum of all the money earned or received by all members of the family in the last year falls. Remember to include public assistance of any kind.

C. 1. Main wage earner: check the item which indicates which member of the family had the largest income last year.

OCCUPATION CLASSIFICATIONS

(primarily derived from the Dictionary of Occupational Titles and its companion book on occupational classifications)

Private household service workers

Private household service workers are involved primarily with the maintenance of homes, their grounds, etc. They are engaged in tasks associated with, for example, cooking meals, caring for children, or caring for the house or yard.

dayworker
houseman
maid
yardman
laundress
butler
cook
companion
housekeeper
nursemaid
babysitter
caretaker

Non-household personal service workers

Personal service workers are involved primarily with services which are given directly to people, hence a major defining characteristic of the work performed by them is that they are in direct contact with the persons to whom they render service and that this service is often designed to make them more comfortable.

barmaid
cook
bartender
waitress
bellhop
kitchen worker
hospital attendant
hotel or motel maid
counterman

Community service workers

Community service workers are involved primarily with services rendered to the community.

crossing guard
attendant
social worker
meter maid
night watchman
postman
policeman
fireman
probation officer

Peabody Cultural Opportunity Screening Scale (continued)

Non-household maintenance service workers

Non-household maintenance service workers are primarily involved in the upkeep of businesses and industrial property. This would include the grounds as well as the physical plant and the equipment of such organizations.

cleaning woman
porter
park keeper
janitor
busboy
road repairman
elevator operator
refuse collector
street cleaner

Day laborers

Day laborers perform simple duties which may be learned in a short time and which require the exercise of little or no independent judgment. Usually no previous experience is required for such employemnt. They are unskilled.

car washer
industrial worker
tobacco picker
food handler
truck loader
shop helpers
construction worker
parking lot attendant
stock boy (in a supermarket, etc.)

Semi-skilled laborers

Semi-skilled laborers perform manual tasks which are less dependent upon dexterity than on vigilance and alertness. They exercise independent judgment which is limited to their task and no broad knowledge of their field is required. Their tasks generally require a high order of manipulative ability and are limited to a well defined work routine.

laundry worker
chauffeur
route man
signalman
truck driver
delivery man
sewing machine operator
coin machine filler
service station attendant

Skilled workers

Skilled workers perform tasks which require a thorough and comprehensive knowledge of the field in which they work, a considerable judgment and a high degree of dexterity. Often they are responsible for the care of valuable equipment. Their jobs usually require extensive training; e.g. apprenticeships or schooling.

dressmaker
auto mechanic
plumber
butcher
seamstress
welder
sheet metal worker
chief baker
bricklayer
painter
photographer
bookbinder

Peabody Cultural Opportunity Screening Scale (continued)

Clerical and sales workers

Clerical and sales workers' duties involve the preparation, transcribing, transferring, systematizing, or preserving of written communications and records in offices, shops, etc.

saleswoman
bookkeeper
cashier
office clerk
timekeeper
telegraph messenger
office machine operator
telephone operator
shipping and receiving clerk

Professional, technical and managerial workers

Professional, technical and managerial workers' occupations require a high degree of mental activity and are concerned with the theoretical or practical aspects of complex fields of endeavor. They require extensive and comprehensive academic study and/or great experience.

nurse
doctor
lawyer
teacher
accountant
electrical engineer
musician
laboratory technician
office or business manager

(2)

APPENDIX C

RAW DATA

Number	Variable
1.	Chronological Age *
2.	Stanford-Binet Intelligence Quotient
3.	Stanford-Binet Mental Age *
4.	Illinois Test of Psycholinguistic Abilities Standard Score
5.	Illinois Test of Psycholinguistic Abilities Language Age *
6.	ITPA: Auditory-Vocal Automatic LA
7.	ITPA: Visual Decoding LA
8.	ITPA: Motor Encoding LA
9.	ITPA: Auditory-Vocal Association LA
10.	ITPA: Visual Motor Sequencing LA
11.	ITPA: Vocal Encoding LA
12.	ITPA: Auditory-Vocal Sequencing LA
13.	ITPA: Visual-Motor Association LA
14.	ITPA: Auditory Decoding LA
15.	Peabody Language Production Inventory Raw Score
16.	Metropolitan Achievement Test: Word Knowledge Grade Equivalent Score
17.	MAT: Word Discrimination Grade Equivalent Score
18.	MAT: Reading Grade Equivalent Score
19.	MAT: Spelling Grade Equivalent Score

*Age scores are recorded in months

[1] For each subject, pretest, interim, and posttest scores are included on all measures except in the case of the Metropolitan Achievement Test (MAT). With the MAT, interim and posttests are provided except for the spelling subtest which is only included as posttest measure since this is not a subtest in the Primary Battery I given at time of interim testing in the Spring, 1966.

Group I: ITA only

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	1	68	90	62	-.35	64	69	70	76
		77	100	77	.52	82	78	66	70
		89	81	74	-.38	88	82	87	70
2	1	75	88	67	-2.53	61	69	75	55
		82	92	76	-.92	73	82	94	70
		95	91	88	-1.02	81	87	105	65
3	1	75	96	72	-1.10	70	51	94	65
		82	99	82	-.56	77	55	105	50
		94	96	92	-.65	85	82	105	70
4	1	73	111	80	1.29	82	78	80	104
		80	124	98	.08	79	82	87	95
		92	123	114	1.24	112+	73	105	104+
5	1	76	112	84	-.73	72	91	70	104
		83	114	94	-.16	81	105	75	88
		95	116	112	.11	94	96	70	104
6	1	71	104	84	-.02	71	82	94	55
		76	116	87	-.42	75	64	87	82
		88	108	96	-1.29	79	73	105	55
7	1	71	103	73	-.64	67	46	70	46
		78	97	76	-1.79	66	60	75	35
		90	99	90	-1.40	78	60	94	50
8	2	79	75	61	-1.04	70	78	66	104
		86	89	78	-2.96	65	55	87	70
		98	83	84	-1.56	76	78	87	65
9	1	78	80	64	-2.60	61	55	57	50
		85	80	70	-2.36	60	55	80	33
		98	76	77	-3.00	64	60	75	33
10	2	69	92	64	-2.63	54	55	70	50
		76	90	69	-1.60	67	73	94	42
		88	94	84	-1.72	75	78	66	35
11	2	69	89	62	-2.01	58	51	75	46
		77	96	74	-1.41	68	73	75	60
		88	84	76	-1.56	76	87	62	60
12	1	80	85	69	-2.53	61	69	66	46
		88	100	89	-1.24	79	91	75	65
		99	83	84	-2.31	79	96	94	70
13	2	79	94	75	-1.28	69	60	62	46
		86	97	84	-1.34	78	64	53	76
		98	98	98	-1.11	89	87	80	76
14	1	71	99	70	-.76	66	42	57	65
		80	97	78	-.67	73	78	66	55
		92	92	86	-.81	84	73	75	76
15	1	73	97	71	-1.33	62	46	70	70
		81	88	72	-1.51	67	73	75	76
		93	95	90	-.81	84	37	70	104
16	2	76	68	54	-3.00	57	33	80	55
		83	77	67	-1.82	65	55	70	82
		97	74	74	-1.13	80	46	87	88

9	10	11	12	13	14	15	16	17	18	19
59	76	79	58	61	49	63				
92	72	72	102+	69	106	42	1.2	1.0-	1.7	
78	88	107	102	78	85	70	1.6	1.5	1.7	1.0-
56	55	76	67	44	55	53				
73	61	83	84	65	62	71	1.3	1.2	1.5	
63	64	83	84	90	106+	68	1.2	1.8	1.9	1.0-
66	64	61	75	90	74	66				
78	88	83	94	73	81	66	1.1	1.5	1.7	
92	68	107	94	78	81	66	1.8	2.2	1.9	1.8
78	68	76	94	94	74	52				
82	64	61	94	90	74	69	1.7	1.7	1.5	
92	73	107	102	102	95	70	2.2	2.1	2.1	1.8
78	61	68	102	56	57	67				
82	81	76	79	52	106	63	1.2	1.4	1.4	
87	88	107	102	73	106	66	2.1	2.4	2.1	1.8
70	64	79	71	73	65	65				
82	64	53	75	73	106	68	1.3	1.4	1.7	
87	101	88	75	90	62	72	1.7	2.2	1.7	1.3
66	76	57	102	69	60	53				
73	55	49	102	90	53	59	1.4	1.4	1.5	
78	64	76	102	103	57	48	1.9	2.6	1.8	2.0
63	94	61	79	73	53	62				
66	64	46	61	61	81	42	1.4	1.3	1.1	
70	72	57	75	86	106	72	1.8	1.4	1.8	2.3
44	64	72	71	65	62	62				
63	68	57	71	61	55	55	1.1	1.5	1.5	
70	83	68	102	48	53	64	1.5	1.9	1.9	1.0-
34	55	38	47	61	71	50				
70	76	68	52	86	57	51	1.5	1.8	1.2	
73	108	57	71	99	106	62	1.9	2.4	1.8	1.9
59	72	53	71	48	44	62				
63	72	68	75	78	57	64	1.4	1.5	1.5	
66	88	100	102	44	95	71	1.7	1.7	1.9	1.6
59	76	49	58	61	62	45				
78	76	79	94	82	77	59	1.4	1.6	1.6	
73	72	76	64	90	85	68	1.9	1.9	2.1	1.8
70	81	72	75	90	71	63				
75	94	107	88	94	65	57	1.8	1.9	1.0-	
92	108	107	79	99	77	73	3.5	4.3	3.3	3.0
66	58	68	84	94	62	63				
82	68	64	102	78	65	37	1.6	1.6	1.5	
92	94	88	75	107	77	63	2.2	2.4	2.0	2.3
73	58	46	75	65	57	33				
73	68	61	64	78	55	52	1.5	1.5	1.4	
99	108	107	84	82	81	61	1.8	1.6	1.9	1.3
56	52	53	64	52	57	28				
70	61	53	75	73	55	43	1.7	1.6	1.2	
82	94	88	88	87	68	73	2.3	2.4	2.3	2.5

Group I: ITA only (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	70	76	55	-.81	66	37	44	76
		79	82	66	-1.60	67	60	49	46
		90	89	82	-2.58	68	37	66	50
18	2	78	80	64	-3.00	46	28	53	33
		87	79	71	-3.00	52	33	57	46
		99	70	72	-3.00	64	28	75	55
19	1	78	98	77	.52	82	60	80	70
		86	114	98	1.19	102	82	105	88
		98	119	118	.11	94	87	105	76
20	2	71	75	55	-2.35	55	46	75	38
		79	79	64	-2.72	60	51	70	42
		91	73	69	-3.00	65	51	70	42
21	1	72	74	55	-3.00	50	28	49	46
		80	86	70	-1.54	67	42	87	42
		92	73	69	-3.00	62	37	57	38
22	2	68	95	65	.04	72	60	75	104
		77	83	65	.64	84	78	75	50
		89	90	82	-2.42	69	51	80	46
23	2	70	86	61	-1.14	63	42	66	55
		78	91	72	-1.04	70	87	44	50
		90	106	96	-.91	77	82	66	82
24	2	76	103	78	-1.35	68	73	66	50
		83	90	76	-.70	75	91	62	65
		95	91	88	-.38	88	82	105	76
25	2	81	81	67	-1.73	66	51	62	55
		88	94	84	-1.67	75	78	80	55
		100	92	94	-1.23	88	91	80	70
26	1	67	92	62	-1.95	52	42	87	42
		76	77	60	-1.91	65	55	75	60
		89	81	74	-2.85	66	55	62	55
27	1	78	84	67	-1.66	66	46	80	65
		87	93	82	-1.29	79	69	87	76
		99	95	96	.00	93	78	87	65
28	2	69	86	60	-2.12	57	46	62	55
		78	100	78	-1.48	67	42	75	82
		90	85	78	-1.88	73	55	75	55
29	2	74	84	63	-1.33	62	46	BN	42
		83	89	75	-1.87	64	64	87	38
		95	84	82	-1.34	78	69	94	60
30	2	79	95	76	-1.41	68	37	62	82
		88	94	84	-1.67	75	51	75	82
		101	93	96	-1.29	87	73	105	88
31	2	78	76	61	-2.22	63	51	49	55
		87	76	68	-1.83	74	73	62	88
		99	87	88	-3.00	72	73	80	50
32	2	70	91	64	-.76	66	37	44	46
		79	93	74	-.60	73	55	70	46
		91	75	70	-1.40	78	78	80	65

9	10	11	12	13	14	15	16	17	18	19
59	68	49	67	86	106	67				
82	68	76	102	40	62	54	1.5	1.4	1.6	
92	94	68	67	69	71	63	2.4	2.6	2.4	
32	55	46	58	73	42	31				
47	72	46	64	61	40	66	1.5	1.1	1.2	
63	88	53	64	94	60	75	1.8	1.5	1.7	1.1
82	108	88	102	82	68	67				
87	81	107	102	107	74	80	1.4	1.2	1.6	
99	101	107	67	107	106	75	3.7	3.9	3.8	3.6
39	68	64	55	65	51	31				
66	72	49	71	65	51	58	1.3	1.3	1.5	
82	76	38	67	86	68	62	1.6	1.9	2.2	1.1
56	50	38	71	48	51	56				
66	81	57	102	69	62	26	1.4	1.3	1.5	
70	52	79	61	90	65	57	1.7	1.8	2.1	1.9
78	88	83	79	56	51	86				
87	76	107	102	90	77	70	1.8	1.5	1.4	
99	68	72	67	107	55	75	3.1	4.3	3.5	3.4
66	76	80	79	52	57	53				
73	76	107	94	65	55	60	3.2	3.1	2.5	
87	94	107	75	94	68	71	3.5	4.9	4.2	4.9
73	64	79	75	61	71	71				
87	76	88	75	69	71	69	1.7	1.5	1.3	
92	94	107	75	82	106	79	2.7	2.8	2.4	2.3
73	76	64	58	94	60	45				
75	88	83	67	86	65	60	2.7	3.1	2.0	
82	108	93	84	111	71	79	3.0	4.6	4.0	4.0
42	44	49	58	65	49	34				
53	72	72	75	69	55	63	1.1	1.3	1.7	
70	72	46	102	78	57	55	1.7	1.8	2.2	1.0
50	81	57	61	78	85	62				
82	88	107	75	86	62	71	1.8	1.7	1.7	
87	81	107	94	107	90	87	3.2	3.4	3.3	3.2
50	64	72	58	48	53	72				
63	76	83	67	78	55	66				
73	76	64	94	73	106	76	2.1	2.6	2.8	1.9
73	94	68	88	78	53	38				
70	68	76	67	65	53	66				
87	76	79	102	103	55	88	3.0	3.4	2.8	4.4
78	108	79	55	65	60	57				
78	108	107	67	48	68	65	2.7	2.1	2.3	
87	108	79	75	94	77	72	3.9	4.6	4.7	4.2
56	64	57	61	69	106	42				
66	76	68	102	65	71	70	2.4	3.1	1.8	
78	64	57	102	82	60	76	3.3	4.9	2.8	4.9
73	64	68	102	78	57	46				
78	88	107	79	69	60	66	1.7	1.4	1.2	
92	81	107	75	90	57	68	3.5	3.4	3.0	2.9

Group I: ITA only (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	2	70	91	64	-1.10	64	78	57	70
		78	100	78	-1.85	65	55	75	35
		89	88	80	-1.99	72	73	105	38
34	1	68	85	59	-1.27	57	42	87	46
		77	101	78	-2.22	63	42	75	65
		88	80	72	-1.99	72	55	105	50
35	2	76	65	52	-3.00	54	46	66	38
		81	78	65	-2.73	57	46	57	42
		93	75	72	-3.00	54	28	53	38
36	2	77	107	82	-1.79	66	55	75	65
		86	106	92	-1.99	72	78	94	38
		98	110	110	.27	97	91	87	60
37	1	78	79	63	-2.47	62	33	66	50
		88	104	92	-1.77	74	73	80	55
		99	87	88	-1.53	85	78	75	70
38	1	71	78	58	-1.90	58	28	66	60
		81	93	76	-1.51	67	37	66	65
		92	101	94	-1.56	76	60	87	70
39	2	67	108	72	-.50	63	51	53	66
		77	110	84	-1.23	69	69	94	55
		88	115	102	.81	106	91	87	55
40	1	78	75	60	-2.35	62	37	49	50
		88	80	72	-3.00	64	60	62	42
		99	83	84	-2.61	75	64	87	70
41	2	75	81	62	-.67	73	73	87	65
		84	89	76	-.97	72	51	70	60
		96	81	80	-1.08	81	60	75	60
42	2	74	88	66	-3.00	59	51	53	42
		84	112	94	-1.37	69	46	57	50
		96	92	90	-1.51	77	64	75	50
43	1	76	83	64	-2.10	64	51	66	70
		85	95	82	-.97	72	60	80	70
		97	89	88	.25	86	100	105	65
44	1	72	72	54	-2.46	55	33	66	46
		82	90	75	-1.96	64	60	75	42
		94	89	86	-1.08	81	64	105	46

9	10	11	12	13	14	15	16	17	18	19
56	70	64	67	44	60	51				
73	72	76	88	52	60	69	1.4	1.5	1.7	
70	81	72	102	65	60	68	2.2	3.0	2.6	2.1
50	68	57	45	65	60	27				
63	76	53	45	90	65	44	1.7	1.7	1.5	
82	94	57	61	99	71	64	1.9	3.2	2.3	2.7
39	52	79	55	61	53	41				
44	58	79	55	69	60	72	1.3	1.2	1.6	
56	55	68	64	56	55	65	2.6	3.6	2.2	2.4
73	58	72	79	48	65	69				
78	64	76	88	69	65	54	2.7	2.6	2.6	
99	64	107	102	65	90	68	4.9	4.3	4.9	4.4
66	58	72	79	82	49	29				
78	64	88	79	78	77	57	1.7	2.0	1.6	
87	81	79	102	86	85	66	3.7	4.9	4.7	4.0
50	68	53	64	99	44	30				
78	81	61	58	94	71	27	1.7	1.5	1.5	
92	72	93	94	86	55	60	3.0	2.5	2.8	2.5
66	58	107	67	69	55	60				
70	72	107	71	56	55	74	1.8	2.2	1.8	
92	108	107	102	86	106	72	3.9	3.2	4.0	4.0
50	50	68	102	78	77	48				
50	58	83	84	86	55	57	1.4	1.4	1.8	
73	88	83	102	44	53	63	2.7	2.7	2.0	2.2
82	108	64	79	69	55	27				
87	94	79	84	73	65	46	1.9	2.2	1.7	
87	108	107	79	94	74	60	3.9	4.6	3.3	3.8
53	64	76	55	48	55	68				
66	88	83	58	69	106	31	1.7	1.5	1.5	
78	61	107	71	78	106	71	3.9	4.3	3.4	4.9
52	61	68	71	52	68	66				
66	94	88	75	65	68	67	1.7	1.7	1.3	
78	101	107	84	78	71	68	2.2	3.0	2.2	2.1
42	64	76	55	56	51	75				
70	64	88	67	56	53	62	1.4	1.6	1.6	
82	101	107	84	99	60		2.7	3.9	3.0	3.2

GROUP II - ITA plus One Year PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	68	69	49	-2.73	46	51	53	33
		77	83	65	-2.29	63	73	49	46
		88	92	82	-2.04	73	64	87	65
2	2	78	98	77	-1.60	67	69	66	55
		97	101	100	-.16	91	96	87	87
3	2	72	103	74	-.64	67	51	36	88
		79	90	72	-.92	71	69	80	82
		90	94	86	-1.13	80	82	80	80
4	1	72	85	62	-.99	64	46	80	65
		80	94	76	-.60	73	69	94	50
		91	97	90	-1.02	81	82	105	70
5	1	70	94	66	-.98	60	42	80	95
		79	98	78	-1.54	67	55	66	82
		90	82	72	-2.47	69	69	80	82
6	1	80	100	80	-.60	73	64	70	50
		89	114	102	-1.29	79	91	70	55
		100	100	102	-.51	96	87	105	65
7	1	86	92	80	-.16	81	87	75	82
		94	94	90	-1.56	76	87	87	70
		105	87	94	-1.35	86	82	80	88
8	2	71	96	68	-.76	66	73	57	42
		79	117	92	.02	78	87	57	46
		90	110	100	.91	109	100	87	65
9	2	70	110	76	-.99	64	46	53	104
		77	101	78	-.54	74	64	80	42
		89	102	92	.16	95	87	94	55
10	1	75	87	66	-3.00	55	60	49	55
		83	88	74	-1.37	69	64	75	50
		94	89	86	-1.56	76	82	70	60
11	1	79	73	60	-3.00	55	37	44	46
		87	78	70	-1.94	73	64	80	70
		98	74	77	-1.13	80	64	70	65
12	1	77	76	60	-3.00	51	51	36	46
		87	75	67	-3.00	64	69	53	50
		98	74	75	2.47	69	78	70	65
13	1	77	86	67	-2.66	60	46	66	55
		84	89	76	-1.19	70	64	105	82
		95	88	86	-.81	84	78	105	104
14	2	75	79	61	-3.00	57	33	44	38
		82	80	67	-1.46	68	55	75	60
		94	81	78	-1.88	73	78	70	65
15	1	77	76	60	-3.00	57	37	75	46
		84	70	61	-1.46	68	60	75	60
		96	68	68	-1.88	73	51	87	44
16	2	71	96	68	-.76	66	55	70	42
		78	97	76	-.23	76	87	80	50
		89	95	86	-.27	90	100	87	60

9	10	11	12	13	14	15	16	17	18	19
44	44	57	55	31	44	42				
59	72	53	61	56	85	67	1.3	1.3	1.6	
82	72	61	71	90	68	77	3.0	4.3	2.8	4.7
63	58	AN	67	65	55	67				
92	68	107	75	107	85	64	3.1	4.9	4.2	4.9
42	108	79	84	65	65					
66	81	72	50	94	68	70	1.5	1.3	1.7	
78	76	76	64	61	106	84	2.2	2.6	2.0	2.4
59	64	93	50	78	57	53				
78	72	79	67	78	81	66	1.6	1.5	1.6	
82	108	72	67	90	68	63	2.4	2.4	2.6	2.5
59	64	27	45	86	60	62				
63	61	72	43	86	107	69	1.5	1.5	1.3	
73	88	61	45	82	65	70	1.8	2.5	1.8	2.1
82	61	72	102	82	81	57				
87	76	57	102	82	62	68	1.8	1.7	1.7	
99	88	64	102	94	95	72	3.3	3.6	3.5	4.9
87	81	107	71	65	95	61				
73	76	107	67	69	60	70	1.5	1.4	1.8	
82	88	107	71	90	85	79	2.6	1.9	1.5	1.0-
63	61	64	75	82	74	54				
92	101	68	102	82	81	62	1.8	2.4	1.6	
82	108	107	102	86	106		3.9	4.6	3.5	4.7
82	50	57	71	56	74	58				
82	68	68	102	56	106	52	1.7	1.4	1.2	
87	81	107	102	86	106	67	2.7	3.2	2.8	4.0
47	55	72	61	48	49	62				
66	76	107	64	69	60	82	1.4	1.5	1.2	
78	94	76	67	78	90	74	3.2	3.6	3.4	4.0
39	47	68	94	61	57	55				
59	72	107	88	48	85	28	1.0	1.1	1.3	
92	108	107	94	82	65	61	1.0	1.7	1.8	1.1
47	44	49	71	56	49	58				
59	50	64	88	90	60	70	1.1	1.2	1.2	
73	64	46	94	69	68	76	1.6	2.0	1.8	1.3
53	52	61	94	61	57	65				
70	61	34	102	73	62	79				
66	68	83	102	99	62	78	2.0	2.6	1.9	2.3
56	58	83	61	82	51	56				
66	68	76	67	86	62	62	1.4	1.9	1.3	
87	80	83	75	73	57	76	3.0	3.2	2.8	3.4
50	47	57	55	44	62	37				
59	61	76	55	90	57	58	1.0-	1.2	1.2	
73	72	76	67	61	53	71	1.9	1.9	2.0	1.0-
70	68	57	102	61	55	79				
87	72	64	102	65	62	73	1.7	1.8	1.6	
92	101	57	102	86	85	66	2.2	1.9	2.2	2.7

Group II - ITA plus One Year PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	73	74	56	-3.00	50	33	66	70
		82	74	63	-2.18	63	42	70	38
		93	71	68	-3.00	62	28	70	46
18	2	78	77	62	-2.53	61	46	66	46
		85	105	90	-1.51	67	69	75	65
		96	90	88	-.27	90	69	80	76
19	1	74	85	64	-2.58	54	42	66	50
		83	89	75	-.88	73	55	70	50
		106	79	86	-2.53	68	82	80	55
20	2	70	76	55	-3.00	42	28	62	50
		77	69	55					
		89	67	62	-3.00	52	33	70	65
21	1	79	78	63	-1.66	66	46	66	55
		88	76	69	-.05	83	73	87	76
		97	95	94	-.11	91	82	105	82
22	1	77	83	65	-2.53	61	69	62	38
		86	89	78	-.97	72	60	57	65
		97	80	80	.11	94	78	94	70
23	2	79	93	74	-1.97	64	37	80	76
		88	104	92	-.54	86	51	75	104
		100	100	102	-1.17	88	82	75	76
24	2	77	91	71	-2.91	59	33	70	50
		86	87	76	-1.51	67	51	70	65
		98	99	84	-1.88	73	69	87	55
25	2	80	75	62	-2.72	60	55	62	50
		87	72	65	-1.78	65	64	62	65
		99	70	72	-2.15	71	69	62	60
26	2	76	78	61	-2.97	58	69	66	60
		85	80	70	-1.55	67	60	70	95
		97	72	72	-2.15	71	78	66	76
27	2	69	64	47	-3.00	45	51	32	35
		78	70	57	-3.00	54	28	57	42
		90	65	61	-3.00	58	37	75	38
28	1	71	99	70	-1.50	61	73	57	76
		78	91	72	-1.79	66	60	75	76
		90	92	84	-1.61	76	73	94	76
29	2	78	80	64	-1.48	67	42	87	46
		86	97	84	-.88	73	51	75	70
		97	89	88	.11	94	87	66	88
30	1	69	87	61	-3.00	49	33	36	46
		78	97	76	-1.60	67	46	44	53
		90	94	86	-1.45	77	73	57	82
31	1	78	62	51	-3.00	41	37	32	30
		88	61	56	-3.00	54	42	32	46
		99	62	64	-3.00	69	51	75	50
32	2	72	94	68	-.47	68	73	62	76
		82	73	62	-1.64	66	60	70	82
		93	84	80	-.86	83	100	80	88

9	10	11	12	13	14	15	16	17	18	19
42	61	42	45	52	44	32				
59	64	49	67	99	68	73	1.3	1.2	1.3	
73	88	61	67	69	53	69	1.8	1.0	1.9	1.0
56	64	31	102	56	77	29				
66	76	53	102	44	51	69	1.3	1.8	1.5	
87	88	107	102	78	95	70	1.6	1.6	2.0	1.0
56	58	64	45	44	55	47				
66	81	72	102	107	60	66	1.2	1.4	1.7	
73	64	107	50	78	57	69	1.7	2.7	2.0	1.9
37	47	42	41	52	29	27				
						38	1.3	1.2	1.6	
39	55	38	55	44	65	42	1.5	1.6	2.0	2.0
66	68	76	84	86	55	63				
92	94	68	88	103	77	70	3.2	2.9	3.0	
99	81	107	102	86	81	81	3.9	4.6	4.4	4.0
63	61	68	75	48	60	32				
73	94	68	102	40	106	72	1.5	1.4	1.7	
78	76	88	102	103	106	70	1.9	2.2	2.1	1.8
82	79	42	84	56	53	69				
94	72	107	94	56	106	80	1.9	1.9	1.6	
78	72	107	75	94	106	84	2.9	3.6	4.2	4.9
56	55	79	55	56	65	60				
73	68	83	61	78	62	53	1.2	1.2	1.5	
82	64	107	67	86	57	85	1.8	1.4	2.2	1.0
66	52	107	55	65	46	79				
73	52	83	75	56	60	89	1.3	1.4	1.1	
73	64	88	79	73	74	93	1.9	2.1	2.0	1.8
53	64	61	64	48	46	23				
66	101	64	64	31	71	35	1.3	1.2	1.5	
78	94	83	55	52	74	70	1.2	1.6	1.7	1.0
29	31	53	71	61	53	77				
47	52	46	61	56	90	66	1.3	1.3	1.3	
53	72	72	52	61	57	90	1.5	1.6	1.5	1.0
47	68	46	64	73	55	54				
73	76	68	58	56	57	89	1.6	1.5	1.4	
66	81	107	67	78	65	85	1.7	2.3	2.3	2.3
78	76	79	67	73	62	58				
78	81	107	79	73	65	80	1.6	1.7	1.2	1.6
82	108	107	102	99	90	84	2.2	2.3	1.9	2.0
53	44	53	52	65	51	39				
65	68	107	67	82	65	81	1.3	1.3	1.6	
66	68	88	75	82	106	77	1.9	1.8	2.1	1.0
30	36	27	61	44	55	42				
29	58	49	84	78	51	62				
70	61	57	102	90	65	67	1.6	1.5	1.9	4.9
56	58	107	52	86	68	83				
70	76	76	52	73	55	80	1.6	1.2	1.7	
70	88	79	94	73	85	76	1.6	2.1	1.6	1.8

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	1	72	91	66	.95	79	64	96	70
		80	105	84	1.26	90	78	94	82
		92	116	108	1.77	112	96	105	94
34	1	78	96	75	-1.16	69	42	57	88
		88	99	88	-.97	82	73	44	104
		99	93	94	.27	97	87	75	104
35	2	74	69	53	-2.01	58	55	62	60
		83	75	64	-2.86	56	28	57	50
		95	67	66	-3.00	62	28	52	70
36	2	79	75	61	-3.00	56	28	53	50
		87	67	61	-3.00	63	42	75	55
		99	70	72	-2.85	66	33	87	55
37	2	78	97	76	-1.16	69	46	87	88
		88	104	92	-.16	91	55	87	76
		99	107	108	-.59	86	64	105	104
38	1	75	87	66	-2.97	58	46	66	82
		85	74	65	-.52	77	82	75	70
		96	85	84	-2.04	72	78	75	76
39	2	76	83	64	-3.00	53	37	53	60
		86	87	76	-2.05	64	33	57	60
		97	70	70	-3.00	64	37	62	60
40	2	77	73	58	-3.00	57	37	54	55
		84	74	64	-2.14	62	55	42	66
		96	64	64	-3.00	64	51	94	55
41	2	70	100	70	-1.38	62	87	49	55
		79	98	78	.52	84	91	70	46
		92	89	84	-.22	78	105	75	88
42	1	75	103	77	-.43	78	82	75	82
		83	119	98	-.52	77	87	94	70
		84	100	96	-.05	92	100	87	88
43	1	72	77	57	-1.85	65	78	57	65
		80	93	75	-.48	74	69	105	70
		92	85	80	-.48	87	69	87	60
44	1	79	101	80	-.60	73	55	70	88
		88	87	78	-1.77	74	69	80	104
		100	90	92	-1.47	85	96	94	104

9	10	11	12	13	14	15	16	17	18	19
78	64	107	67	78	81	68				
92	72	107	88	82	95	83	1.7	1.9	1.7	
92	108	107	102	107	106	91	3.7	4.3	3.4	3.4
70	50	107	102	44	81	45				
73	58	83	102	94	77	92	1.6	1.3	1.2	
87	108	107	102	73	57	91	1.6	1.7	2.2	1.0-
50	47	53	84	52	60	36				
53	47	61	67	61	59	64	1.2	1.1	1.1	
73	76	88	58	69	65	68	1.5	1.6	1.7	1.0
47	52	79	55	78	46	63				
53	68	83	64	78	51	70	1.2	1.2	1.3	
73	88	68	58	94	53	69	1.4	1.6	1.9	1.0
60	81	57	75	69	68	70				
70	88	107	102	99	85	85	1.5	1.4	1.5	
87	88	93	61	99	90	73	2.0	3.4	2.0	2.0
47	52	57	61	73	53	62				
78	58	107	79	82	74	68	1.7	1.5	1.5	
87	88	68	64	94	49		1.7	2.2	2.1	2.3
44	58	57	50	65	51	78				
59	58	107	67	69	60	81	1.0	1.2	1.3	
70	88	68	52	56	85	65	1.9	1.5	2.2	1.0
47	52	72	55	86	51	65				
53	70	61	71	73	62	64	1.3	1.4	1.3	
63	76	38	58	86	65	68	1.7	1.0	1.9	1.0
78	72	34	50	69	65	81				
87	72	107	75	90	85	87	1.7	1.7	1.6	
87	108	88	79	86	81	73	2.9	3.9	3.0	4.0
87	61	107	88	52	85	65				
82	68	79	94	56	77	68	1.5	1.3	1.4	
78	68	107	102	86	90	81	2.9	2.8	3.2	2.3
56	52	64	102	56	51	57				
73	64	57	102	73	57	66	1.8	1.8	2.0	
78	81	107	102	86	65	76	3.0	4.3	3.0	4.4
66	81	68	102	78	55	74				
82	94	107	67	44	62	72	1.9	2.0	1.9	
78	81	72	84	99	71	85	3.1	3.2	2.3	2.4

Group III - ITA plus Two Years PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	74	61	48	.14	79	73	62	104
		83	66	57	-2.73	57	37	49	42
		94	72	70	-2.31	70	46	62	50
2	2	78	86	68	-2.47	62	28	75	46
		86	88	77	-1.10	71	64	94	55
		98	83	84	-2.15	71	64	87	88
3	2	68	95	65	-1.32	57	28	57	60
		77	88	69	-1.48	67	55	53	65
		89	93	84	-2.80	66	60	53	82
4	2	73	86	64	-1.61	60	51	44	46
		82	78	66	-2.50	59	42	70	33
		94	76	74	-3.00	62	42	80	46
5	2	78	84	67	-1.66	66	60	70	76
		87	98	86	-1.88	73	96	57	76
		99	101	102	-.75	84	96	70	82
6	1	78	82	65	-2.72	60	36	80	55
		87	75	67	-2.09	63	60	80	60
		99	71	73	-1.61	76	60	105	70
7	1	75	97	73	-1.04	70	64	75	55
		85	95	82	-.92	73	78	80	76
		97	94	92	-.65	85	96	105	70
8	1	79	101	80	-.60	73	55	70	88
		88	87	78	-1.77	74	69	80	104
		100	90	92	-1.47	85	96	94	104
9	2	78	103	80	-1.66	66	51	105	50
		85	90	78	-1.01	72	51	87	55
		98	98	98	-2.26	70	78	62	70
10	2	70	94	66	-.02	71	55	75	70
		77	91	71	-1.10	70	51	70	46
		89	88	80	-1.56	76	64	66	38
11	1	74	91	68	-2.12	57	46	49	55
		83	98	82	-.16	81	60	70	82
		95	82	80	-1.72	75	78	75	60
12	1	74	85	64	-.59	67	42	62	70
		83	85	72	-1.78	65	46	49	65
		95	76	74	-1.61	76	73	75	60
13	2	70	92	65	-1.10	64	33	44	60
		79	84	68	-.36	75	33	53	55
		91	73	69	-1.77	74	46	70	50
14	1	69	77	55	-3.00	41	37	53	35
		78	76	61	-3.00	54	33	57	50
		90	65	61	-3.00	62	37	75	35
15	2	79	82	66	-3.00	55	28	80	42
		86	72	64	-1.87	64	46	75	70
		98	74	75	-3.00	64	60	80	46
16	1	71	99	70	-1.72	60	46	40	46
		79	84	68	-1.78	65	60	84	65
					-1.34	78	87	87	65

9	10	11	12	13	14	15	16	17	18	19
78	108	68	102	90	53	50				
42	94	79	61	69	49	65	1.6	1.2	1.5	
56	94	107	58	90	81	45	1.7	1.6	1.9	1.0-
70	76	72	67	44	62	57				
73	88	64	75	69	71	65	2.0	1.3	1.8	
87	88	49	67	78	60	69	2.5	2.8	2.4	2.5
59	64	83	55	48	51	87				
73	68	72	88	99	49	71	1.6	1.5	1.8	
82	68	79	52	73	60	80	3.7	1.7	1.7	3.0
50	72	49	102	52	71	38				
66	55	61	75	73	55	67	1.4	1.4	1.7	
73	68	46	58	86	55	75	2.4	2.1	1.9	2.3
66	64	42	75	73	74	49				
82	81	68	71	78	65	75	3.2	2.5	2.8	
87	94	79	75	99	81	64	4.6	3.9	2.4	3.0
44	50	81	67	56	60	74				
56	81	68	71	48	46	58	1.8	1.7	1.7	
70	76	79	67	73	106	69	2.8	1.8	2.5	2.1
82	47	68	67	82	95	59				
92	68	64	64	90	62	81	1.7	1.2	1.8	
99	101	68	75	73	106	69	2.4	3.0	1.9	2.3
66	81	68	102	78	55	74				
82	94	107	67	44	62	72	1.9	2.0	1.9	
78	81	72	84	99	71	85	3.1	3.2	2.3	2.4
78	81	53	102	44	51	64				
73	68	79	102	65	57	72	1.6	1.7	1.6	
82	72	61	61	94	65	65	2.8	2.9	2.5	3.4
70	44	57	102	69	85	64				
82	64	42	102	82	62	74	1.7	1.5	2.0	
82	72	83	102	94	60	63	2.0	2.9	2.2	2.2
50	50	53	79	69	57	52				
70	68	107	102	99	53	80	2.4	1.6	1.8	
87	108	64	75	82	65	84	2.2	2.2	1.8	2.1
59	64	76	102	56	53	80				
78	58	49	102	44	65	58	1.8	1.3	1.7	
82	81	68	102	65	55	59	2.3	2.4	2.2	2.4
50	76	61	88	69	85	64				
53	64	64	102	103	106	72	1.9	1.5	1.7	
78	108	107	102	56	55	75	2.5	3.6	2.3	2.9
37	31	42	47	73	29	32				
53	68	57	61	52	46	29	1.0-	1.2	1.1	
46	55	88	67	82	65	73				
56	61	49	75	48	51	63				
53	64	64	84	69	60	61	1.2	1.1	1.5	
63	68	61	102	52	55	76	2.2	2.4	1.9	2.6
56	64	57	102	40	51	35				
70	65	79	102	56	60	67	1.3	1.4	1.8	
92	61	68	102	86	65	72	1.9	1.6	2.3	2.1

Group III - ITA plus Two Years PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	2	75	93	70	.55	76	96	94	65
		83	77	66	-.52	77	91	75	70
		94	92	88	-.81	84	96	57	60
18	2	74	85	64	-.59	67	42	62	70
		83	85	72	-1.78	65	46	49	65
		95	76	74	-1.61	76	73	75	60
19	1	75	75	58	.14	79	73	75	55
		83	95	80	-2.73	57	73	80	60
		94	81	78	-2.31	70	91	105	60
20	2	72	86	63	-1.41	68	73	87	104
		82	81	68	-1.37	69	42	70	76
		98	81	82	-1.24	79	78	66	104
21	1	74	73	56	-2.69	53	37	66	42
		84	80	69	-2.09	63	55	62	42
		94	77	75	-2.04	72	55	80	70
22	2	72	82	60	-1.90	58	73	57	50
		81	81	67	-1.69	66	55	66	35
		92	91	85	-.48	87	64	66	82
23	1	70	89	63	-.08	71	46	87	88
		79	90	72	-.67	73	60	84	65
		91	95	88	-1.51	77	46	75	76
24	2	72	94	68	-.08	71	73	75	65
		79	87	70	-.73	72	82	75	88
		91	118	108	-.59	86	82	75	65
25	1	71	72	53	-3.00	49	46	44	70
		78	69	56	-2.53	61	33	87	42
		89	76	70	-3.00	58	37	94	82
26	2	74	70	54	-3.00	48	46	32	35
		82	68	58	-2.46	60	51	87	65
		94	87	84	-1.94	73	60	53	65
27	2	76	83	64	-2.35	62	60	62	82
		84	86	74	-2.14	62	60	80	46
		96	94	92	-.97	82	78	66	76
28	1	68	99	67	-1.50	61	46	66	76
		77	107	82	-.36	75	73	62	82
		88	108	96	-.16	91	105	94	104
29	2	71	86	62	-1.50	61	42	66	70
		78	87	69	-2.41	62	55	75	42
			85	78		77			
30	2	69	102	70	-1.10	64	46	45	82
		78	103	80	-1.60	67	60	66	55
		90	99	90	-.59	86	82	87	70
31	1	76	87	67	-2.16	63	69	70	60
		84	94	80	-1.10	71	73	66	55
		95	103	98	-.16	91	114	107	104
32	2	70	87	62	-.70	66	42	57	46
		79	93	74	-.36	75	64	87	55
		91	102	94	-.91	82	87	105	60

9	10	11	12	13	14	15	16	17	18	19
66	81	76	61	65	95	25				
82	94	107	67	90	53			1.8	1.6	
70	68	107	88	94	111	73	3.5	4.9	4.2	4.4
59	64	76	102	56	53	80				
78	58	49	102	44	65	58	1.8	1.3	1.7	
82	81	68	102	65	55	59	2.3	2.4	2.2	2.4
50	36	45	64	40	74	50				
66	64	83	75	99	53	65	1.6	1.2	1.5	
82	76	107	102	90	90	45	1.7	1.6	1.9	1.0-
53	76	64	61	48	62	40				
87	81	68	45	99	71	58	1.3	1.8	1.6	
70	72	107	55	90	106	67	2.7	3.9	2.6	4.0
42	58	41	58	86	42	32				
63	68	72	55	61	77	34	1.6	1.3	1.5	
73	88	107	64	78	60	62	1.4	1.9	1.8	1.3
50	47	45	50	107	51	72				
70	64	79	67	90	65	69	1.1	1.5	1.5	
78	81	107	67	86	90	87	3.5	4.6	3.0	3.2
66	58	68	102	52	60	27				
66	58	83	71	94	77	67	1.6	1.3	1.4	
87	68	107	67	103	74	81	3.2	3.9	2.5	2.6
66	76	61	71	94	65	37				
82	76	83	67	48	71	65	1.8	2.8	1.7	
87	76	107	102	69	106	91	3.7	2.9	3.2	3.0
37	44	46	55	52	51	37				
53	64	61	61	44	106	26	1.4	1.1	1.1	
70	68	68	30	65	57	57	1.2	1.6	1.1	1.0-
42	76	27	55	61	53	69				
50	58	49	64	56	60	52	1.0	1.0	1.3	
78	72	107	71	78	62	56	1.4	1.5	2.1	1.0-
53	52	38	84	74	57	30				
56	47	61	79	69	71	35	1.7	1.7	1.4	
82	68	107	79	94	90	66	4.9	4.3	2.4	4.2
56	55	49	102	52	55	37				
87	64	83	84	82	71	48	1.7	2.5	2.0	
87	72	107	75	94	68	78	4.9	4.9	4.7	3.4
63	58	53	67	90	49	71				
63	58	68	67	78	53	68	1.1	1.4	1.4	
						71	1.6	2.6	1.8	1.8
70	88	46	84	56	55	28				
73	61	79	64	73	68	67	1.7	2.1	1.3	
99	76	107	84	82	57	71	4.2	4.6	2.6	4.4
63	101	61	64	48	51	55				
70	72	83	67	73	81	68	2.9	2.8	2.5	
82	61	107	84	69	90	80	4.9	4.3	3.3	4.2
63	94	88	71	90	55	63				
82	108	68	102	82	53	67	1.8	2.1	1.5	
82	108	64	94	86	71	53	4.6	4.3	3.8	4.4

Group III - ITA plus Two Years PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	1	72	93	67	-.42	68	73	80	65
		80	91	74	-.48	74	60	75	50
		91	103	92	-.97	82	64	94	50
34	2	70	95	67	-.19	70	78	57	65
		80	94	76	-1.35	68	73	75	65
		91	93	86	.00	93	55	80	70
35	2	71	89	64	-1.90	58	60	75	60
		79	94	75	-1.23	69	55	87	65
		89	93	82	-1.97	75	73	87	70
36	1	78	69	56	-3.00	50	46	62	42
		88	58	54	-2.69	69	64	105	35
		99	62	64	-3.00	69	51	75	50
37	1	70	84	60	-2.35	55	46	66	104
		79	78	63	-2.53	61	55	40	88
		92	92	84	-2.37	69	51	75	95
38	1	90	78	72	-3.00	61	46	57	46
		98	75	76	-2.61	75	73	94	60
		106	87	86	-1.29	87	135	105	70
39	1	78	103	80	-1.97	64	64	75	88
		87	95	84	-1.40	78	82	87	70
		97	119	118	.43	99	105	87	82
40	1	71	89	64	-2.01	57	37	70	46
		79	87	70	-2.04	64	60	80	46
		91	81	76	-1.67	75	46	66	50
41	1	74	97	72	-2.86	52	28	49	55
		83	83	70	-1.33	69	64	66	76
		93	91	86	-.81	84	64	94	70
42	2	75	71	55	-3.00	54	28	66	60
		83	80	68	-1.64	66	42	75	46
		94	79	76	-1.13	80	69	75	82
43	1	73	91	67	-1.38	62	46	75	82
		83	101	84	-1.15	71	55	87	95
		95	88	86	-.59	86	73	87	82
44	1	69	90	63	-2.24	56	33	66	60
		79	90	70	-1.66	66	33	80	60
		91	84	78	-1.29	79	60	80	70

9	10	11	12	13	14	15	16	17	18	19
63	52	61	88	99	55	46				
73	52	107	94	82	85	59	1.8	1.8	1.8	
92	68	107	102	78	106	70	3.3	3.2	2.6	2.9
66	52	57	102	52	85	54				
70	68	61	102	61	55	48	1.1	1.9	1.6	
82	88	107	102	86	106	64	3.5	3.9	2.6	4.4
70	55	64	43	52	55	55				
63	72	88	52	69	81	61	1.4	1.4	1.5	
87	64	88	58	73	90	72	2.2	2.8	2.6	2.3
29	31	46	94	56	53	48				
53	64	83	102	94	53	51				
70	61	57	102	90	65	67	1.6	1.5	1.9	4.9
47	72	38	50	52	40	48				
56	76	68	58	44	65	64	1.5	1.6	1.3	
78	61	107	58	65	62	73	2.5	3.4	3.2	4.0
73	64	76	61	48	65	69				
73	72	107	71	90	60	67	1.3	1.0	1.1	
92	94	107	102	73	65	81	1.9	3.6	2.6	2.6
70	61	72	94	48	38	45				
82	68	79	102	78	60	60	3.2	2.6	2.6	
87	81	107	102	90	81	93	4.9	4.3	3.3	4.7
63	58	61	67	44	60	52				
70	55	49	79	90	55	72	1.2	1.2	1.3	
82	72	107	102	94	68	73	2.9	3.2	2.6	3.2
50	58	57	61	52	51	36				
70	69	72	55	90	74	35	1.6	1.7	1.5	
78	88	107	61	99	106	64	2.7	4.6	2.7	3.8
39	55	61	58	69	51	36				
59	88	79	67	69	71	51	1.1	1.2	1.2	
73	76	107	94	65	85	66	2.0	3.6	2.5	2.2
53	58	88	67	44	53	74				
78	72	83	71	69	53	70	1.4	1.4	1.5	
92	88	107	79	86	95	69	2.3	3.0	2.0	2.6
47	52	27	79	56	74	50				
66	60	79	75	65	62	53	1.4	1.0	1.1	
87	61	107	102	61	85	80	2.2	3.2	1.8	2.6

Group IV - WIC ONLY

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	72	89	65	-.59	67	51	70	70
		80	87	71	-1.64	66	51	80	82
		91	92	86	-.75	82	60	105	82
2	2	80	86	70	.02	78	60	75	65
		87	93	82	-1.56	76	69	75	60
		98	91	92	-.59	86	91	94	65
3	2	73	79	59	-1.27	63	87	57	70
		82	81	68	-1.24	70	87	70	60
		93	86	82	-1.56	76	100	75	46
4	2	71	85	61	-3.00	57	33	36	70
		80	81	66	-.92	73	37	75	95
		96			-2.04	72	82	80	76
5	2	67	83	57	-.45	64	51	57	46
		76	109	82	-.36	75	60	87	46
		88	108	96	-.70	85	100	62	50
6	1	78	91	72	-.48	74	87	75	60
		87	100	88	-1.61	75	60	80	76
		99	103	104	-.43	88	73	94	76
7	2	73	99	72	-.25	69	78	53	82
		80	100	80	-.38	79	87	80	70
		92	98	92	-1.88	73	78	105	65
8	2	74	74	55	-1.91	65	69	75	50
		83	80	68	-1.91	64	69	80	50
		95	76	74	-1.77	74	69	80	46
9	1	69	87	61	-2.01	58	46	62	104
		78	89	70	-.73	72	78	57	82
		90	101	92	-.86	83	78	75	70
10	1	78	79	63	-3.00	53	33	57	50
		87	73	66	-2.96	65	28	87	55
		99	69	71	-2.31	70	28	87	42
11	2	78	72	58	-2.85	59	51	70	38
		87	73	66	-1.88	73	69	70	50
		99	74	76	-2.26	70	42	87	35
12	1	71	102	72	-1.10	64	91	44	42
		85	83	72	.70	84	64	80	76
		90	106	96	-.27	90	82	105	82
13	1	72	77	57	-2.41	55	27	53	38
		81	76	63	-2.18	62	33	44	35
		93	80	76	-2.80	66	55	66	42
14	2	73	71	54	-3.00	46	37	49	46
		82	77	65	-2.73	57	33	70	38
		89	79	72	-3.00	59	55	57	46
15	2	78	80	64	-1.91	65	64	57	55
		87	82	73	-2.96	65	78	70	38
		97	86	86	-.43	78	60	75	76
16	1	73	80	60	-1.72	60	37	66	50
		82	81	68	-3.00	54	33	57	46
		93	79	76	-2.90	66	28	87	50

9	10	11	12	13	14	15	16	17	18	19
53	72	64	67	48	71	68				
73	72	107	55	56	49	67	1.4	1.2	1.3	
78	72	107	71	78	106	82	2.0	1.7	1.9	1.8
92	88	68	79	82	106	64				
82	72	93	67	73	106	68	1.8	1.8	1.5	
99	68	107	71	90	90	72	2.3	2.4	2.7	3.6
70	72	49	61	56	51	64				
73	72	93	58	69	60	68	1.9	1.9	1.7	
70	68	93	71	94	74	72	2.9	4.3	3.7	4.9
50	58	57	71	48	77	27				
63	68	83	88	52	106	66	1.4	1.4	1.7	
50	68	61	88	86	74	71	2.0	1.5	1.7	1.0
66	47	49	102	40	74	50				
70	52	93	102	78	68	65	1.3	1.4	1.7	
87	72	83	102	94	81	64	1.8	1.5	1.6	1.6
70	68	61	102	103	60	63				
66	61	88	84	69	106		1.6	1.4	1.6	
78	72	107	102	90	95	66	1.8	2.1	2.2	2.4
82	68	72	71	61	68	25				
87	72	83	75	61	106	61	2.9	3.1	3.0	
92	72	72	75	86	51	28	4.6	4.3	4.7	4.9
66	61	72	61	86	53	26				
73	68	49	55	65	68	53	1.6	1.4	1.3	
78	72	83	71	86	85	40	2.7	3.4	2.7	4.2
56	44	57	55	56	57	34				
87	61	88	61	94	62	70	1.3	1.1	1.3	
92	82	107	67	94	77	76	1.9	1.5	1.6	1.0-
66	72	49	55	69	31	26				
70	61	79	71	65	68	52	1.1	1.2	1.4	
87	68	64	75	99	81	70	1.9	1.6	1.8	1.0
63	72	49	67	61	55	48				
82	76	79	75	86	74	59	1.3	1.1	1.3	
66	108	68	94	99	55	73	1.7	3.0	2.7	2.7
70	88	57	67	52	62	35				
82	76	107	88	86	106	57	1.8	1.8	1.7	
92	94	107	71	103	85	63	2.2	2.7	3.3	3.8
47	58	76	61	69	55	36				
63	68	61	71	94	74	70	1.6	1.4	1.3	
73	72	53	67	83	62	62	1.9	2.2	1.9	2.0
34	50	38	67	69	29	68				
56	61	61	71	69	51	72	1.1	1.0-	1.5	
59	72	49	52	69	65	72	1.9	1.7	1.6	1.6
50	58	72	67	56	106	27				
70	72	57	94	69	51	58	1.4	1.1	1.1	
82	108	72	88	90	68	59	1.8	2.2	1.3	1.6
53	72	64	47	65	74	66				
59	61	46	55	56	55	69	1.2	1.0	1.1	
63	72	49	61	78	106	69	1.7	1.5	1.7	1.0-

Group IV - WIC ONLY (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	2	77	86	67	-1.97	64	55	75	55
		86	77	68	-1.10	71	73	70	70
		96	81	80	-.70	85	69	84	95
18	1	67	73	51	-3.00	45	33	49	33
		76	67	53	-3.00	47	51	57	42
		88	71	64	-3.00	56	37	70	55
19	1	75	91	69	-2.29	63	60	75	55
		84	83	71	-.97	72	51	87	76
		95	108	104	-.16	91	78	87	76
20	1	78	96	75	-1.48	67	55	66	70
		87	105	92	-.75	84	82	87	104
		98	106	106	-.32	97	96	105	104
21	1	72	103	74	-1.61	60	51	53	76
		81	104	84	-.92	73	73	87	88
		92	98	92	1.24	112	91	105	70
22	2	71	91	65	-.81	66	26	80	50
		81	98	80	-1.15	72	46	70	55
		92	94	88	-1.72	75	55	70	60
23	1	72	97	70	-.30	69	78	62	65
		81	93	76	-1.19	70	55	66	55
		92	85	80	-1.83	74	64	75	50
24	1	67	82	56	-2.35	55	33	44	46
		77	78	62	-2.85	59	55	62	35
		89	75	69	-3.00	65	60	66	52
25	2	79	76	62	-1.91	64	33	66	60
		88	77	70	-2.26	70	33	49	76
		99	74	76	-1.23	88	64	75	88
26	2	69	69	50	-3.00	46	28	44	35
		78	70	57	-3.00	44	28	40	30
		88	72	67	-3.00	53	55	80	30
27	1	74	91	68	-1.67	60	42	66	65
		81	77	64	-2.27	61	64	87	65
		92	82	78	-1.08	81	78	105	70
28	1	74	79	60	-2.72	60	51	80	55
		84	79	68	-.83	74	51	94	46
		95	83	82	-.91	82	64	87	70
29	2	72	89	65	-1.04	64	78	75	38
		82	97	80	-.56	77	96	66	50
		93	103	98	-.16	91	100	70	50
30	1	77	90	70	-.79	72	60	94	70
		87	88	78	-1.99	72	78	75	65
		98	110	110	-.97	82	82	91	94
31	1	68	97	66	-1.27	63	42	57	50
		78	97	76	-1.91	65	55	75	55
		89	100	90	-1.45	77	60	75	65
32	2	73	76	57	-3.00	54	37	62	38
		83	77	66	-1.87	64	64	57	46
		94	75	73	-2.47	69	60	75	42

9	10	11	12	13	14	15	16	17	18	19
59	55	76	71	69	65	47				
66	64	72	88	78	68	62	1.3	1.4	Inc.	
82	108	72	67	99	62	71	1.9	2.4	2.2	2.0
42	61	61	41	44	42	20				
53	55	53	50	61	40	44	1.0-	1.0-	1.1	
59	68	49	52	61	51	76	1.6	1.5	1.7	1.0-
53	68	68	67	73	51	50				
59	68	79	94	90	65	64	1.8	1.1	1.5	
73	108	76	102	107	87	73	3.1	3.9	3.3	3.0
70	64	93	50	65	77	86				
78	68	76	102	86	65	66	2.1	2.5	1.9	
87	108	107	102	78	68	72	3.0	4.3	3.2	3.4
63	61	72	84	44	53	54				
73	64	72	64	86	68	63	1.4	1.5	1.5	
108	108	93	102	107	85	74	2.7	3.0	2.4	2.2
70	61	83	79	48	85	80				
78	76	107	94	82	57	80	1.6	1.6	1.6	
108	76	107	79	86	60	80	2.7	3.0	2.8	2.6
87	94	68	75	61	53	52				
82	68	76	84	82	68	64	1.4	1.5	1.6	
82	64	79	75	94	81	38	1.8	1.8	1.9	1.0-
44	61	46	64	86	62	10				
59	94	31	64	86	53	34	1.4	1.4	1.5	
59	94	53	71	82	57	45	1.7	2.0	2.1	1.0-
50	81	76	102	61	55	43				
78	68	93	102	73	65	61	1.9	1.9	1.5	
87	81	107	102	90	81	70	2.9	4.3	3.3	3.6
42	52	57	37	48	60	24				
47	55	46	50	48	46	47	1.4	1.1	1.0	
66	72	27	58	61	38	59	2.2	2.9	2.3	3.2
44	68	57	94	61	51	55				
66	58	49	75	40	53	58	1.1	1.0	1.1	
73	64	46	102	86	106	75	1.7	1.9	2.3	1.1
44	55	57	94	61	57	57				
63	68	57	102	82	85	69	1.3	1.4	1.5	
82	64	107	102	111	62	90	2.2	2.3	1.7	1.6
70	76	64	84	52	49	74				
87	108	57	102	73	55	66	1.9	3.6	1.3	
87	94	107	102	78	106	79	2.3	4.6	3.8	3.8
66	61	88	58	90	77	70				
87	72	64	55	82	85	77	1.2	1.4	1.5	
87	101	79	61	90	81	91	1.9	2.3	1.6	1.9
56	68	76	79	82	53	48				
66	72	57	88	69	53	56	1.5	1.7	1.1	
87	88	83	79	87	77	77	2.4	3.0	2.1	2.1
50	68	53	55	65	53	72				
53	88	72	61	86	60	44	1.3	1.1	1.7	
66	94	107	75	56	62	77	1.9	2.6	2.0	2.3

Group IV - WIC ONLY (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	1	77	103	79	.20	80	82	70	65
		87	105	92	-.65	85	78	70	70
		99	95	96	.97	97	100	105	82
34	2	75	79	61	-3.00	56	33	49	46
		83	83	70	-2.09	63	33	75	42
		95	85	83	-1.94	73	69	70	35
35	2	69	99	68	-.64	67	55	94	55
		78	93	73	-1.91	65	64	66	42
		90	99	90	-2.04	72	91	80	70
36	2	79	67	55	-3.00	55	37	40	38
		89	76	70	-1.99	72	69	40	65
		101	72	75	-2.31	78	96	87	55
37	1	78	84	67	-1.79	66	51	105	70
		87	73	66	-1.83	74	51	75	65
		99	85	86	-1.08	81	78	94	76
38	1	80	86	70	-.98	71	37	94	46
		88	92	82	-2.80	66	51	66	55
		100	84	86	-2.01	80	73	105	82
39	1	72	103	74	-.54	74	73	75	65
		82	92	76	.07	84	96	105	50
		94	100	96	-1.24	79	100	87	42
40	2	74	76	58	-3.00	46	28	44	50
		84	75	65	-2.82	57	33	70	50
		96	67	67	-3.00	62	28	57	35
41	2	78	91	72	-1.48	67	55	62	50
		88	81	73	-2.04	72	69	62	42
		99	87	88	-1.88	73	69	75	46
42	1	75	78	60	-3.00	47	33	40	50
		84	66	58	-2.64	58	60	80	42
		95	71	70	-2.68	58	42	80	76
43	1	75	81	62	-.92	71	42	66	76
		84	86	74	-1.15	71	42	87	88
		95	81	80	-.22	90	37	66	104
44	2	69	103	71	-.30	69	82	57	104
		78	105	82	.64	84	73	75	70

9	10	11	12	13	14	15	16	17	18	19
73	68	107	75	82	81	62				
92	76	107	71	78	81	70	1.7	1.7	1.6	
92	64	107	94	90	106	85	3.1	3.6	3.1	2.6
39	64	64	61	56	77	36				
56	88	53	102	56	53	60	1.8	2.0	1.6	
70	88	68	102	90	57	72	2.6	3.4	2.7	2.7
63	52	93	75	78	55	77				
70	55	107	64	65	62	69	1.9	2.3	1.6	
70	64	93	64	82	55	73	3.3	3.9	3.4	2.6
66	58	49	67	69	53	73				
70	68	93	79	86	85	64	1.3	1.4	1.2	
87	68	88	102	61	57	67	2.2	3.2	2.8	3.6
59	68	72	55	82	55	60				
82	72	93	75	82	74	71	1.6	1.7	1.4	
78	88	79	75	73	106	84	2.9	3.4	2.8	2.9
82	81	107	71	82	55	31				
78	72	79	102	52	51	62	1.6	1.8	1.6	
73	81	79	102	78	74	73	2.2	3.9	2.4	2.7
63	76	107	75	90	62	45				
73	76	61	102	94	102	56	1.6	1.8	1.7	
82	76	83	88	82	77	71	2.2	2.5	2.0	3.0
42	47	64	41	48	53	75				
59	58	79	47	61	51	49	1.3	1.4	1.3	
66	61	107	61	69	68	80	1.9	1.6	1.9	1.0-
73	61	72	102	86	57	41				
82	76	68	102	94	65	56	1.7	1.6	1.5	
99	108	53	67	73	90	62	2.6	3.0	2.8	2.6
34	36	46	55	56	62	24				
39	52	42	61	86	65	76	1.3	1.2	1.3	
53	64	38	55	61	55	37	1.4	1.3	1.7	1.0
70	72	49	102	90	77	71				
73	58	64	102	61	71	68	1.6	1.7	1.5	
99	108	107	102	103	57	64	2.5	2.8	2.6	2.1
73	64	61	75	69	60	24				
82	101	79	88	103	85	39	2.7	3.6	2.5	

Group V - WIC plus One Year PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	75	93	70	-2.22	63	42	66	50
		83	88	74	-1.69	66	46	75	82
		94	79	76	-2.26	70	73	80	55
2	1	69	102	70	.10	72	69	66	46
		77	113	86	.83	85	64	87	104
		88	106	94	.11	94	82	94	55
3	1	75	97	73	-1.91	65	64	62	55
		83	108	90	.65	92	82	87	104
		94	103	98	.59	102	87	80	82
4	1	80	100	80	-1.10	70	82	70	65
		88	113	100	-.86	83	82	80	65
		100	100	102	-1.05	90	105	105	95
5	2	69	76	54					
		79	82	66	-1.16	69	64	44	76
		91	81	76	-1.77	74	87	75	36
6	1	76	109	82	.39	81	78	94	104
		84	125	104	.29	87	91	105	104
		96	123	120	.27	97	96	94	104
7	1	78	89	70	-2.04	64	60	75	50
		87	86	76	-.65	85	78	70	60
		98	80	81	-3.00	71	51	70	60
8	2	72	79	58	-1.21	63	46	70	50
		81	93	76	-.61	76	51	75	76
		93	82	78	-1.99	72	64	80	82
9	2	75	96	72	-.79	72	69	105	60
		84	84	72	-.61	76	91	66	65
		95	88	86	-1.72	75	78	80	46
10	2	72	103	74	1.46	84	82	57	104
		81	104	84	-1.33	69	82	49	76
		92	96	90	-.70	85	87	80	70
11	2	78	91	72	-1.97	64	64	75	50
		88	96	86	-1.24	79	82	75	50
		98	102	102	-1.34	78	75	80	50
12	1	76	85	66	-2.53	61	69	53	42
		85	103	88	-.02	83	96	62	82
		97	99	98	-.59	86	91	87	70
13	2	74	79	60	-1.72	66	46	44	46
		82	97	80	-.61	78	82	62	55
		93	97	92	-1.29	79	64	62	82
14	1	69	82	58	-2.07	57	55	62	30
		79	89	83	-1.66	66	33	70	38
		90	82	76	-2.04	72	69	75	50
15	1	70	92	65	-1.85	65	60	70	65
		80	95	77	.14	79	73	105	76
		91	102	94	-.81	84	78	94	82
16	1	74	79	60	-.99	64	64	49	65
		81	89	73	-1.78	65	51	53	60
		92	73	69	-1.40	78	55	66	70

9	10	11	12	13	14	15	16	17	18	19
56	50	46	67	82	104	68				
59	68	64	61	73	71	74	1.3	1.3	1.5	
73	68	93	67	61	68	66	1.6	2.2	1.9	1.0-
70	61	93	102	69	65	78				
73	72	107	102	78	81	83	1.3	1.4	1.2	
87	72	107	102	69	90	79	2.2	2.2	1.9	2.7
47	61	64	76	74	62	45				
66	94	107	102	82	65	66	1.5	1.2	1.7	
82	108	107	102	90	106	71	1.9	1.9	1.7	2.1
82	72	93	67	52	45	30				
92	64	107	64	86	106	67	1.5	1.3	1.6	
92	94	107	61	82	90	76	2.1	2.5	1.9	2.4
						92				
56	72	73	84	82	71	91	2.6	1.9	2.1	
59	81	107	75	99	57	86	2.6	1.9	2.1	1.9
78	76	107	75	65	55	70				
82	101	76	84	61	85	91	1.6	1.5	1.4	
108	88	107	84	90	90	89	2.3	2.6	2.2	2.3
59	68	42	102	48	62	14				
73	88	93	102	73	106	80	1.8	1.9	1.8	
82	81	57	102	86	53	77	2.7	3.2	3.0	3.8
50	61	107	58	69	62	52				
63	61	93	102	99	81	80	1.6	1.5	1.7	
82	64	53	88	78	74	73	2.0	2.0	2.0	1.0
66	61	107	71	99	51	46				
82	72	79	71	73	90	82	1.5	1.3	1.5	
75	94	61	71	99	71	67	2.3	2.5	2.4	2.3
92	108	88	102	69	60	53				
73	61	83	88	78	51	77	2.4	2.4	2.2	
92	94	61	88	82	111	86	2.9	3.6	3.3	4.2
59	58	68	84	56	65	25				
78	68	107	94	78	95	77	1.6	1.6	1.7	
78	72	88	102	86	60	73	2.1	2.6	2.2	2.6
59	64	64	61	56	71	50				
87	88	93	64	90	106	70	1.4	1.3	1.3	
92	108	83	75	90	81	76	2.1	2.0	1.9	2.0
53	55	57	102	52	55	64				
59	88	93	102	56	71	70	1.5	1.3	1.6	
73	101	76	102	86	60	72	2.3	2.8	2.1	3.4
50	61	38	102	56	62	24				
66	64	68	102	56	74	67	1.1	1.3	1.0	
73	81	68	102	56	57	63	1.7	2.4	1.6	2.0
70	64	72	75	61	55	34				
78	94	72	88	86	68	65	1.3	1.3	1.6	
92	76	64	94	99	85	60	2.0	1.9	1.9	1.6
47	68	72	102	52	53	60				
70	58	88	102	52	53	76	1.4	1.0-	1.2	
70	72	72	102	82	95	79	1.7	1.6	1.3	1.0

Group V - WIC plus One Year PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	2	73	70	53	-2.86	52	42	62	30
		82	86	72	-.97	72	60	70	55
		94	86	83	-2.15	71	73	57	46
18	2	72	83	61	-1.50	61	42	49	46
		81	77	64	-1.48	67	46	53	46
		93	79	76	-1.29	79	69	87	60
19	2	76	100	76	-.60	73	69	53	70
		86	94	82	-.20	81	96	87	65
		97	103	102	-.38	88	91	94	65
20	2	72	86	63	-.70	66	46	75	42
		81	110	89	-1.15	71	55	75	70
		93	106	100	-.97	82	87	62	70
21	1	76	87	67	-1.10	70	46	70	76
		85	98	84	-.47	78	60	80	82
		97	97	96	-.75	84	82	105	70
22	2	72	100	72	-.87	65	73	80	42
		81	117	94	-.34	80	69	80	88
		92	103	96	-.81	84	87	94	76
23	2	71	91	65	-.93	65	37	75	50
		80	90	73	-.29	76	55	75	65
		91	104	96	-1.02	81	78	62	88
24	1	72	76	56	-2.46	55	55	57	50
		82	78	66	-2.09	63	55	62	55
		94	70	68	-2.04	72	64	75	65
25	1	74	102	75	-.87	65	73	62	46
		84	112	94	-.02	83	87	62	76
		95	119	114	.43	99	96	105	104
26	2	72	97	70	-.99	64	37	49	55
		82	84	70	-.92	73	46	57	65
		93	79	76	-.65	85	82	66	88
27	1	70	79	57	-1.44	62	40	80	88
		79	78	63	-.79	72	55	94	95
		91	75	70	-2.53	68	55	80	82
28	1	78	72	58	-3.00	55	64	49	55
		87	70	63	-1.54	67	64	80	60
		99	68	70	-2.96	65	42	75	70
29	1	72	80	59	-1.50	61	42	66	60
		81	78	65	-1.19	70	69	70	55
		93	77	74	-2.47	69	55	62	76
30	1	73	97	71	-.23	76	69	80	82
		80	89	72	-.92	73	60	70	60
		94	92	88	-.97	82	42	80	70
31	1	77	90	70	-1.41	68	51	75	55
		87	100	88	-.48	87	87	105	70
		99	87	88	-.65	85	82	94	65
32	1	69	79	56	-1.21	63	37	75	50
		79	83	67	-.54	74	55	49	76
		91	97	90	.78	72	60	75	70

9	10	11	12	13	14	15	16	17	18	19
42	68	27	41	99	65	15				
73	72	76	94	94	65	43	1.8	2.4	1.3	
92	81	57	102	69	62	65	2.5	4.3	2.6	4.4
63	64	83	67	52	68	67				
70	88	107	84	65	60	73	1.3	1.3	1.2	
73	101	88	102	99	55	78	1.8	1.9	2.1	2.2
87	64	83	102	78	55	65				
82	72	79	102	44	74	80	1.6	1.5	1.5	
82	72	107	102	61	85	72	2.7	2.9	2.6	2.4
63	68	93	102	44	68	49				
82	72	107	71	52	55	76	1.6	1.6	1.5	
82	76	107	75	82	90	69	2.9	2.7	3.3	2.3
66	61	79	79	56	106	64				
82	68	68	102	86	60	89	1.9	2.4	1.9	
82	76	61	94	90	106	70	3.0	4.6	3.3	4.4
66	72	64	52	65	74	76				
82	64	107	71	94	71	81	1.7	1.8	2.0	
92	72	83	79	103	74	80	2.7	2.9	3.3	3.4
73	64	76	64	61	74	59				
82	108	107	94	69	57	75	2.4	2.6	2.1	
82	88	107	102	78	57	85	2.7	4.6	3.8	4.2
50	58	42	58	48	62	52				
73	72	64	75	52	53	50	1.4	1.5	1.5	
82	76	64	102	69	62	69	1.9	2.3	2.0	1.4
82	61	49	75	61	74	60				
108	88	93	102	82	71	91	2.1	3.6	2.3	
99	101	93	94	107	85	88	4.9	4.6	4.0	4.9
78	88	83	61	73	57	61				
73	94	79	102	90	60	73	1.7	2.4	1.2	
82	64	72	102	90	85	82	2.7	3.0	3.0	2.7
59	50	61	61	48	62	73				
73	68	88	61	86	57	78	1.4	1.5	1.3	
73	61	72	75	56	68	66	1.8	1.9	1.7	1.0-
44	68	53	61	56	46	32				
73	61	76	79	52	62	72	1.3	1.2	1.5	
66	72	79	88	52	51	69	1.9	1.4	1.6	1.0-
56	58	79	71	52	60	28				
70	61	107	71	69	62	66	1.3	1.4	1.2	
66	73	76	75	82	68	80	1.8	1.7	2.1	1.6
70	81	68	102	86	65	48				
87	81	83	88	78	60	82	1.7	1.6	1.7	
87	101	107	102	90	57	75	2.4	2.4	3.3	2.3
66	61	64	102	56	62	31				
78	81	72	102	82	81	84	Inc.	1.4	1.3	
78	68	107	102	78	65	74	1.7	1.6	1.6	1.6
59	58	46	102	48	53	21				
82	81	107	102	52	51	74	1.5	1.4	1.6	
73	61	107	102	61	81	64	1.9	2.2	1.9	1.8

Group V - WIC plus One Year PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	1	78	66	54	-3.00	54	28	57	42
		87	69	62	-2.26	70	42	87	42
		100	65	67	-2.10	72	33	70	46
34	2	71	110	77	.83	78	37	77	95
		81	119	96	2.01	98	64	70	88
		92	121	112	.86	107	78	66	95
35	2	73	77	58	-3.00	55	37	57	55
		82	74	63	-.88	73	28	80	50
		94	76	74	-2.53	68	37	75	46
36	1	67	102	68	-.76	66	46	80	50
		77	94	73	.33	81	51	87	82
		89	102	92	-1.02	81	73	80	65
37	1	68	75	53	-2.63	47	33	62	38
		78	79	63	-3.00	58	28	53	42
		90	73	68	-3.00	62	28	70	50
38	1	73	64	49	-3.00	52	28	80	42
		82	72	61	-3.00	52	28	70	82
		95	69	68	-3.00	64	46	70	60

9	10	11	12	13	14	15	16	17	18	19
42	58	46	84	48	62	33				
66	72	72	88	90	77	75	1.4	1.4	1.4	
66	76	68	102	86	106	87	2.0	1.7	1.9	1.4
66	64	72	102	94	95	66				
82	108	107	102	99	106	82	2.9	3.1	2.9	
82	108	107	102	86	106	86	4.9	4.6	4.7	4.7
44	58	49	94	52	46	53				
66	64	107	102	99	81	79	1.6	1.7	1.4	
66	81	83	102	73	55	91	2.1	2.9	2.7	2.4
78	55	72	102	56	46	66				
78	64	107	102	86	57	76	2.5	2.8	1.9	
82	88	107	102	82	55	73	4.2	4.9	3.8	4.4
42	40	53	75	40	38	76				
59	50	88	67	61	62	71	1.5	1.3	1.3	
66	64	88	64	48	65	73	2.2	2.0	1.8	1.0-
29	55	53	75	78	49	29				
37	68	64	61	48	31	64	1.3	1.3	1.0	
59	68	79	61	69	62	82	1.8	1.9	1.7	1.0-

Group VI - WIC plus Two Years PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	68	95	65	-1.90	58	33	75	60
		77	83	65	-1.91	65	37	53	65
		89	79	72	-1.72	75	87	70	55
2	1	82	72	61	-3.00	52	28	70	65
		91	69	65	-3.00	65	46	94	76
		102	86	90	-.57	95	82	105	95
3	2	72	82	60	.66	77	73	80	104
		81	88	72	-.29	80	78	75	104
		92	89	84	-1.61	76	69	80	104
4	1	78	94	74	.27	80	100	66	95
		87	73	66	.07	84	73	105	82
		98	94	94	-.16	91	96	75	95
5	2	74	94	70	-.70	66	46	66	60
		83	114	94	-.56	77	51	66	70
		94	107	103	-.16	91	73	94	76
6	2	74	97	72	.72	77	60	62	65
		83	98	82	-.34	79	73	94	55
		94	96	92	.97	112	100	94	76
7	1	71	83	60	-.53	67	37	87	60
		80	87	71	.27	80	64	84	60
		92	92	86	-.27	90	55	87	76
8	1	77	110	84	.70	84	69	87	82
		86	124	106	.43	89	91	75	76
		95	116	112	.11	94	96	94	88
9	1	75	81	62	-1.48	67	60	70	76
		84	80	69	-1.51	67	69	70	76
		96	70	70	-1.77	74	82	75	76
10	2	68	75	53	-2.46	55	37	70	46
		78	83	66	-2.78	60	46	66	42
		89	69	64	-3.00	62	51	49	38
11	2	67	92	62	.52	72	96	70	55
		77	88	69	-.85	72	73	49	76
		88	87	78	-1.13	80	105	70	65
12	1	68	90	62	-.99	64	55	75	76
		78	94	74	-.17	77	96	94	82
		89	86	78	-1.18	80	105	66	70
13	1	77	66	53	-3.00	46	37	62	46
		85	74	65	-2.00	63	42	87	55
		96	68	68	-3.00	63	51	49	82
14	2	77	96	74	-.67	73	105	70	76
		85	100	86	.34	88	91	75	104
		96	94	92	.00	93	96	94	104
15	2	76	91	70	-1.66	66	55	53	60
		83	111	92	-.47	78	82	70	65
		94	105	100	-.65	85	109	75	95
16	1	73	108	78	.38	74	51	80	60
		81	114	92	.92	97	82	80	104
		92	119	110	.97	112	78	105	104

9	10	11	12	13	14	15	16	17	18	19
50	76	49	45	73	65	22				
82	64	83	84	61	55	70	1.2	1.4	1.5	
73	76	68	84	90	74	67	1.8	2.8	2.1	1.9
47	58	49	45	52	53	65				
53	64	72	65	52	62	72	1.3	1.3	1.5	
82	76	106	102	82	90	68	1.5	2.1	1.9	3.0
70	58	53	90	69	65	55				
66	108	79	67	94	68	86	1.8	1.9	1.5	
73	61	107	64	90	57	74	2.9	2.8	3.3	4.2
70	72	76	58	103	106	40				
73	81	107	102	69	81	72	1.8	1.9	1.7	
73	68	107	102	56	71	67	2.9	3.9	2.5	3.6
66	72	61	102	82	55	65				
87	81	107	102	86	65	62	1.8	2.6	2.0	
82	108	112	102	90	57	77	2.7	4.6	3.2	4.2
87	88	93	88	78	81	59				
92	72	68	102	86	68	60	1.9	2.4	1.9	
99	101	107	102	99	106	71	3.1	3.9	3.3	2.7
63	55	93	102	48	71	59				
82	64	107	102	56	85	68	1.5	1.3	1.5	
92	88	107	111	78	81	57	1.9	2.1	2.1	3.2
78	108	72	84	84	106	66				
92	55	93	102	107	106	64	2.5	2.3	2.5	
99	72	107	102	90	106	70	4.9	4.9	4.9	3.6
70	81	57	61	48	81	30				
70	50	93	71	48	65	70	1.5	1.2	1.2	
92	72	107	79	52	60	75	1.7	1.7	1.9	1.0-
44	58	49	58	73	53	22				
63	72	53	67	78	49	58	1.2	1.3	1.5	
63	61	72	102	65	53	47	2.4	2.7	2.1	2.9
63	64	72	84	86	65	22				
78	72	79	88	78	62	48	1.4	1.4	1.6	
87	61	93	102	78	57	56	1.6	2.1	2.2	1.9
73	55	64	75	52	60	42				
78	61	76	79	90	60	70	1.3	1.2	1.3	
92	76	72	94	73	77	90	1.5	2.1	2.3	1.3
37	52	31	67	40	40	24				
47	55	64	64	78	81	49	1.3	1.2	1.2	
59	61	61	67	82	60	37	1.6	1.5	2.0	2.3
59	61	93	67	73	68	55				
78	68	107	102	78	71	75	1.2	1.3	1.5	
87	81	93	102	99	85	76	1.8	1.4	1.9	1.0
73	58	107	67	52	68	39				
87	55	107	75	82	77	63	1.3	1.4	1.7	
87	58	107	88	73	90	75	2.4	2.8	2.5	2.9
78	58	93	102	73	77	71				
99	72	107	102	82	106	67	1.7	1.7	1.4	
92	88	107	102	82	95	68	2.4	4.3	2.5	4.0

Group VI - WIC plus Two Years PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	2	73	86	64	-2.35	55	46	32	42
		83	85	72	-1.01	72	37	75	55
		95	84	82	-1.51	77	55	70	88
18	1	69	105	72	-1.04	64	37	66	55
		77	98	76	-.79	72	64	94	55
		94	96	92	-.32	89	82	87	76
19	2	73	80	60	-1.72	60	55	49	65
		82	72	61	-2.14	62	51	57	60
		94	87	84	-2.85	66	51	75	46
20	2	77	77	61	-1.66	66	60	49	76
		85	80	70	-1.06	72	87	49	60
		98	121	120	-.59	86	73	75	104
21	2	79	79	64	-3.00	56	42	36	65
		88	77	70	-2.53	68	55	75	55
		95	91	88	-2.58	68	64	57	55
22	2	72	85	62	-2.81	52	60	53	76
		81	78	65	-2.18	62	60	66	46
		94	86	83	-2.58	68	69	87	42
23	1	71	69	51	-2.69	53	37	62	55
		80	72	60	-2.35	62	55	53	60
		93	89	85	-2.10	72	60	94	60
24	1	71	88	63	.27	73	82	75	82
		80	116	92	.89	86	87	87	82
		92	112	104	.59	102	109	105	104
25	2	77	96	74	.39	81	96	80	55
		87	90	80	-1.02	81	55	62	70
		99	109	110	-.16	90	78	66	70
26	2	77	81	64	-2.66	60	55	53	38
		86	77	68	-.65	76	60	105	42
		98	83	84	-1.56	76	55	80	50
27	2	79	93	74	.20	80	96	80	88
		88	99	88	-.54	86	105	80	82
		101	97	100	-.33	98	96	105	95
28	1	72	91	66	-.47	68	64	62	70
		82	94	78	.02	84	55	66	60
		93	119	112	-.32	89	73	75	76
29	1	73	82	61	-2.66	60	28	75	42
		83	89	75	-1.06	72	46	80	50
		94	87	84	-1.94	73	28	94	50
30	2	74	100	74	-.64	67	55	70	60
		84	92	78	-.16	81	73	62	70
		94	76	74	-1.24	79	78	66	76
31	2	71	85	61	-2.58	54	55	66	55
		82	84	70	-1.15	71	55	62	65
		92	89	84	-.86	83	87	66	70
32	1	73	77	58	-1.33	62	55	62	76
		83	80	68	-1.42	68	64	94	70
		93	82	78	-1.34	78	55	87	95

9	10	11	12	13	14	15	16	17	18	19
44	72	68	67	44	65	45				
63	108	107	67	78	68	77	1.2	1.4	1.3	
63	31	107	75	56	85	61	1.9	2.7	2.2	2.3
66	68	76	75	52	71	67				
82	72	68	88	61	74	80	1.6	1.6	1.4	
92	88	93	102	86	81	72	2.2	2.2	2.4	2.1
50	58	61	67	78	55	58				
63	72	57	61	86	55	73	1.5	1.4	1.4	
66	72	49	55	107	74	70	2.1	3.0	2.2	2.3
63	64	72	67	65	81	60				
73	55	93	84	73	77	69	1.4	1.7	1.3	
87	108	68	102	86	74	76	2.4	3.6	2.1	2.7
47	108	27	84	52	74	23				
66	76	49	102	65	74	62	1.5	2.2	1.4	
82	94	57	71	78	68	65	2.2	4.3	2.1	3.0
42	47	53	52	52	49	30				
66	72	76	52	61	57	64	1.2	1.4	1.1	
70	81	88	75	52	57	58	2.6	3.4	2.5	2.9
44	47	64	64	52	51	29				
63	58	61	67	56	77	64	1.0	1.4	1.4	
78	81	68	67	82	68	74	1.8	1.7	1.2	1.8
73	64	83	79	86	55	51				
78	72	107	64	99	74	78	1.7	1.4	1.4	
92	88	107	64	99	95	79	2.8	4.6	3.7	2.5
87	108	79	102	69	60	55				
92	81	107	102	82	95	68	1.9	1.9	1.3	
92	108	107	79	103	95	76	2.9	3.9	3.1	3.0
66	64	49	61	86	62	55				
73	64	107	64	86	106	72	1.4	1.4	1.5	
87	81	72	75	94	95	60	1.8	1.6	1.9	1.8
87	61	76	75	71	71	40				
78	68	76	88	90	106	75	1.7	1.8	1.6	
78	108	88	102	99	106		1.9	1.6	1.7	0
78	81	107	64	52	55	32				
82	108	107	102	90	77	77	1.4	1.4	1.2	
92	94	76	102	94	90	76	2.2	2.8	3.0	2.5
63	76	53	61	65	68	22				
78	108	72	71	82	68	60	1.6	1.4	1.3	
92	68	93	102	86	57	70	1.9	1.7	1.1	1.9
66	81	68	55	69	77	69				
82	64	107	94	82	90	81	1.7	1.7	1.7	
82	108	68	88	78	85	81	2.7	2.6	2.4	2.2
53	61	53	52	44	46	38				
70	64	107	64	94	68	68	1.6	1.5	1.5	
78	88	93	84	82	106	66	2.3	3.6	2.6	2.9
50	68	72	45	82	62	62				
70	76	61	64	78	57	64	1.4	1.1	1.2	
82	76	76	67	88	106	64	1.8	1.6	1.9	1.3

Group VI - WIC plus Two Years PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	1	73	79	59	-3.00	46	33	44	46
		83	57	50	-2.09	63	55	75	95
		94	83	80	-2.10	72	82	66	70
34	2	74	91	68	-1.84	59	42	105	55
		84	86	74	.20	86	73	70	70
		95	97	94	-.48	87	51	94	70
35	1	76	81	63	-3.00	48	33	62	42
		86	73	65	-1.19	70	64	87	88
		97	72	72	-1.51	77	46	80	55
36	1	72	74	55	-3.00	56	33	57	46
		82	73	62	-1.60	67	42	75	55
		93	74	71	-1.34	78	55	75	65
37	1	76	93	71	-3.00	55	51	80	76
		86	82	72	-1.01	72	55	49	65
		97	78	78	-.54	86	78	80	76
38	2	76	68	54	-3.00	52	46	70	50
		86	77	68	-1.28	69	46	87	95
		96	75	74	-1.45	77	55	70	55
39	1	75	84	64	-2.97	58	51	62	60
		85	82	71	-1.19	70	82	53	70
		96	92	90	-.65	85	73	94	70
40	1	77	96	74	-1.60	67	37	70	82
		87	88	78	-1.06	72	69	66	65
		97	91	90	-.70	85	69	87	82
41	1	75	85	65	-1.78	59	42	62	65
		83	93	78	-.65	76	55	62	65
		93	99	94	-1.34	77	78	87	76
42	2	70	92	65	.52	72	55	75	65
		77	104	80	-.54	74	55	80	50
		88	106	94	-.11	94	69	50	95
43	1	88	81	73	-2.47	69	51	75	70
		97	76	76	-.91	82	73	87	76
		108	81	90	-.81	92	69	105	88
44	2	77	61	50	-3.00	47	30	30	46
		86	69	62	-2.32	61	46	53	46
		98	71	72	-2.74	67	51	66	70

9	10	11	12	13	14	15	16	17	18	19
47	61	31	43	52	53	39				
70	68	57	55	65	46	35	1.3	1.7	1.4	
66	101	83	75	86	46	68	2.2	3.6	2.3	2.4
47	81	64	50	56	51	61				
82	101	93	102	94	95	64	1.8	1.8	1.3	
87	94	93	102	90	95	78	2.4	3.9	3.2	3.0
47	61	42	43	44	51	21				
70	76	42	84	86	60	49	1.7	1.5	1.2	
78	108	83	102	73	65	64	1.9	2.0	1.8	2.0
50	64	83	47	61	55	60				
63	61	83	102	69	60	70	1.3	1.2	1.1	
78	68	93	102	73	85	76	1.7	1.7	2.1	1.3
47	55	49	55	56	44	35				
66	76	93	102	65	65	49	1.1	1.2	1.2	
73	94	107	102	78	60	72	1.7	1.5	2.1	1.1
56	72	57	50	48	31	63				
56	64	72	71	86	68	65	1.4	1.3	1.6	
78	108	107	102	94	55	72	2.2	3.4	2.1	2.0
63	72	49	50	65	55	48				
78	101	83	75	56	55	71	1.8	2.4	1.5	
87	101	107	102	73	57	72	2.4	3.4	2.4	2.9
63	81	88	67	73	53	45				
87	81	107	61	69	60	50	2.0	2.4	1.8	
92	101	107	67	73	65	73	3.1	4.6	3.3	4.7
50	72	68	55	61	57	19				
87	64	93	102	94	65	27	1.2	1.2	1.2	
108	72	68	102	44	60	68	1.2	1.6	1.1	1.0-
73	72	83	67	78	68	60				
92	76	93	102	90	51	68	1.7	2.1	1.2	
82	108	107	102	111	85	80	2.4	3.4	3.1	2.3
70	64	68	79	61	81	55				
82	58	107	102	94	74	70	1.2	1.2	1.6	
92	64	107	102	94	95	63	1.9	1.9	2.1	1.1
37	47	72	52	56	53	62				
50	61	107	52	78	60	66	1.2	1.3	Inc.	1.0-
59	76	83	67	82	55	70	1.7	1.4	1.9	1.0-

Group VII - SCRP Only

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	73	76	57	-3.00	49	42	44	35
					-3.00	52	42	70	38
		92	68	65	-3.00	59	64	66	50
2	1	78	80	64	-2.85	59	60	44	55
		86	84	74	-1.10	71	82	105	88
		97	80	80	-1.88	73	69	80	70
3	1	78	96	75	-2.22	63	82	80	70
		86	84	74	-1.28	69	82	87	82
		97	91	90	-1.67	75	82	70	55
4	1	76	77	60	-2.85	59	82	75	38
		87	86	76	-2.37	68	87	75	50
		97	89	88	-1.13	80	96	44	70
5	2	77	110	84	-1.41	68	78	105	70
		85	108	92	-.11	82	78	87	70
		96	102	100	-.81	84	78	75	70
6	1	75	71	55	-2.97	58	51	57	35
		83	80	68	-2.50	59	64	94	46
		93	84	80	-1.99	72	64	80	46
7	1	81	89	73	-1.06	72	55	66	55
		89	95	86	-1.83	74	55	70	82
		99	111	112	-.27	99	78	94	95
8	2	77	98	76	-1.23	69	60	62	55
		84	117	98	.47	90	60	105	95
		96	109	106	.32	97	78	87	104
9	1	75	96	72	-1.79	66	42	87	65
		84	112	94	-.74	75	37	87	82
		95	99	96	.05	93	73	105	88
10	2	79	91	73	-1.60	67	46	80	35
		86	99	86	-.91	82	91	53	104
		98	88	88	-.22	90	87	80	60
11	2	76	87	67	-2.78	60	42	80	70
		83	75	64	-1.69	66	46	70	42
		95	71	70	-2.90	66	33	70	65
12	2	69	105	72	-1.10	64	46	53	50
		76	97	74	-.23	76	73	80	65
		87	88	78	-.43	88	105	80	70
13	1	73	86	64	-2.12	57	51	44	82
		80	86	70	-1.37	69	51	57	104
		92	85	80	-2.04	72	60	80	76
14	2	76	85	66	-1.97	64	37	70	46
		85	88	76	-1.33	69	46	62	70
		96	87	86	-.75	84	69	75	65
15	1	70	103	72	-1.61	60	42	66	38
		78	108	84	.08	79	64	87	70
		91	118	108	-.65	85	82	80	46
16	2	78	86	68	-1.85	65	51	49	46
		86	84	74	-1.82	65	60	53	46
		97	86	86	-.59	86	73	80	60

9	10	11	12	13	14	15	16	17	18	19
39	50	46	58	52	62	66				
44	72	49	55	48	44	48	1.0	1.1	1.2	
56	64	34	67	82	49	60	1.6	2.1	1.9	1.9
63	52	79	61	61	55	51				
59	58	76	50	65	95	51	1.1	1.3	1.3	
82	58	107	71	69	65	69	1.7	2.3	2.0	2.0
59	50	61	61	73	51	62				
66	76	88	64	52	53	66	1.4	1.5	1.7	
87	76	107	61	82	74	74	2.6	3.4	2.1	2.6
63	52	42	67	56	57	58				
88	68	57	75	61	68	65	1.2	1.2	1.5	
73	72	83	102	90	77	67	1.8	2,2	1.9	1.6
59	58	76	71	86	46	63				
73	81	107	75	99	77	43	1.8	1.6	1.5	
78	108	79	71	111	81	69	2.8	2.8	2.7	2.5
50	47	49	64	82	85	48				
50	64	53	61	56	53	40	1.1	1.2	1.5	
87	64	72	61	90	106	53	1.5	2.1	2.2	1.8
63	76	64	79	78	106	38				
87	76	64	102	90	60	39	1.9	1.6	1.7	
92	108	107	102	94	106	58	2.4	3.0	2.7	2.3
82	76	68	102	61	62	39				
70	72	107	102	93	77	52	1.6	2.2	1.6	
82	101	93	102	107	90	67	3.3	4.6	3.7	4.7
92	81	53	50	82	57	53				
82	107	79	79	56	74	74	2.0	1.8	2.0	
82	108	61	102	99	95	66	3.3	4.6	3.4	4.7
78	88	49	75	94	62	62				
66	58	83	102	94	106	70	1.7	1.9	1.7	
73	64	107	102	90	106	72	3.9	3.9	3.2	4.0
47	50	53	84	48	65	32				
63	76	72	75	73	68	64	1.4	1.2	1.3	
63	68	46	102	73	71	58	2.2	2.4	2.6	4.4
59	61	61	102	90	57	54				
78	76	72	88	94	68	68	2.9	3.1	2.7	
87	101	72	102	94	71	71	3.9	4.9	3.7	4.9
47	50	64	61	69	53	60				
53	61	107	55	78	77	62	1.3	1.3	1.6	
63	81	88	64	80	65	74	2.2	2.0	2.1	1.9
59	61	76	75	90	62	72				
78	81	72	75	90	57	69	1.4	1.4	1.5	
92	108	107	102	94	55	76	1.8	2.1	1.9	1.3
56	61	57	102	52	65	50				
87	108	83	102	52	74	67	2.5	2.8	2.7	
99	81	107	102	73	90	72	3.9	4.9	3.8	3.6
59	64	61	102	73	68	78				
78	101	49	84	56	62	67	1.8	2.8	1.9	
78	108	64	102	99	81	79	3.0	4.3	3.4	4.4

Group VII - SCRP Only (Cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	75	87	66	-3.00	54	37	36	46
		84	84	72	-1.73	66	51	75	60
		95	65	92	-1.29	79	87	94	70
18	2	73	99	72	-1.84	59	42	80	50
		80	93	75	-1.04	70	60	87	55
		91	84	78	-2.20	71	78	62	42
19	2	73	88	65	-1.38	62	37	62	88
		80	89	72	.27	80	64	75	76
		93	102	96	-.38	88	100	87	50
20	2	73	94	69	-1.04	64	42	62	35
		81	85	70	-.85	72	64	57	42
		92	78	74	-.22	90	91	75	50
21	1	81	76	63	-2.10	64	51	53	46
		88	84	76	-1.51	77	78	80	60
		99	75	77	-2.31	78	82	62	55
22	2	71	86	62	-2.69	53	28	57	60
		80	86	70	-.54	76	64	62	70
		91	86	80	-.22	90	64	87	65
23	1	71	81	59	-1.33	62	69	53	42
		79	93	74	-1.35	68	64	66	50
		89	107	96	-1.08	81	96	62	70
24	2	69	79	56	-1.10	64	33	57	55
		79	82	66	-1.66	66	55	49	55
		89	86	78	-1.40	78	82	70	55
25	1	76	103	78	-2.35	62	28	80	70
		83	95	80	-1.19	70	33	80	76
		94	94	90	-.75	84	64	70	76
26	1	71	91	65	-1.10	64	51	94	50
		80	94	76	.20	80	60	87	70
		91	106	98	.27	97	91	94	76
27	2	71	102	72	.32	74	78	70	70
		81	111	90	-.16	81	91	70	104
		91	102	94	.65	103	109	105	76
28	1	79	93	74	-1.54	67	82	75	42
		87	90	80	-2.04	72	73	105	65
		98	83	84	.16	95	96	105	55
29	2	80	101	81	-1.78	65	55	87	60
		87	90	80	-1.99	72	60	62	60
		95	86	84	-2.15	71	73	80	55
30	1	70	81	58	-3.00	51	33	44	55
		79	82	66	-.29	76	55	87	65
		92	90	84	-1.24	79	55	105	60

9	10	11	12	13	14	15	16	17	18	19
50	72	61	52	69	53	82				
78	72	76	61	65	57	76	2.0	2.5	1.7	
78	88	107	71	86	53	60	2.9	3.6	3.2	4.0
56	64	72	55	52	55	58				
66	88	93	64	86	55	66	2.5	2.6	2.0	
73	88	88	71	78	65	58	3.3	4.3	3.3	4.0
63	64	81	41	86	53	29				
87	68	88	75	86	106	60	2.7	3.1	3.2	
99	61	107	79	90	106	47	4.2	4.6	3.4	4.2
82	52	57	106	86	62	69				
73	64	59	106	82	71	67	2.9	2.8	1.9	
82	61	107	102	111	71	71	2.9	4.6	3.3	3.4
56	81	61	64	48	106	38				
70	81	64	79	78	106	43	2.1	3.6	1.8	
99	72	76	75	82	106	55	3.2	4.3	3.5	4.4
47	52	88	58	48	44	69				
87	76	107	84	52	68	69	1.6	2.1	1.7	
92	94	107	102	62	106	63	3.1	3.6	2.7	2.5
59	64	79	67	73	53	73				
78	64	79	71	65	74	55	1.9	3.6	1.8	
92	81	107	94	82	57	66	2.8	4.9	3.3	4.7
53	64	46	71	91	106	83				
63	68	57	84	90	74	27	2.1	1.9	1.6	
87	94	93	94	73	65	67	3.1	3.6	3.3	4.0
63	64	72	58	56	65	70				
80	94	68	75	73	65	60	1.9	2.4	2.1	
92	81	107	61	99	106	66	3.5	3.4	3.7	3.6
63	55	93	67	48	60	75				
92	81	107	88	78	71	78	2.5	3.6	1.9	
99	68	107	102	103	81	74	4.9	4.6	4.7	4.4
63	72	83	88	69	77	92				
70	72	79	67	82	106	92	3.2	3.9	2.2	
92	94	107	102	90	90	71	4.9	4.6	4.7	4.9
63	52	81	67	61	74	57				
82	64	68	64	99	57	62	1.8	2.1	1.6	
108	81	107	79	103	106	68	2.6	2.5	2.3	2.0
59	50	79	61	99	55	67				
87	72	68	75	103	71	70	2.4	2.2	2.2	
73	94	79	71	94	46	61	3.3	3.4	3.2	3.6
47	52	72	71	35	42	54				
63	58	88	102	103	77		1.4	1.6	1.1	
78	64	79	88	99	95	56	2.5	3.4	1.9	3.6

Group VIII - SCRP plus One Year PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	1	75	78	60	-1.55	61	42	62	65
		82	92	76	-1.69	66	69	75	60
		93	73	70	-2.10	72	69	80	60
2	1	73	91	67	-1.16	63	51	53	42
		81	90	74	-.65	76	51	70	38
		93	93	88	-.65	85	64	87	70
3	1	69	99	68	-.19	70	64	105	60
		78	105	82	-.85	72	73	87	95
		89	98	88	-.11	91	91	105	88
4	2	73	96	70	.10	72	87	62	42
		81	101	82	-.11	82	69	57	60
		92	101	94	.38	98	96	94	76
5	2	79	90	72	-2.10	64	33	70	65
		87	110	96	-2.69	67	73	87	60
		98	98	98	.32	97	78	105	88
6	2	72	88	64	-1.78	59	33	94	50
		82	89	74	-1.28	69	55	80	60
		93	84	68	-1.56	76	78	94	60
7	1	75	84	64	-3.00	55	73	57	42
		85	93	70	-2.82	57	73	66	46
		97	95	94	-1.67	75	87	105	46
8	2	80	79	65	-3.00	58	42	94	42
		87	84	75	-1.56	76	73	105	46
		99	89	90	-.43	88	91	94	82
9	1	82	102	84	-2.09	63	60	40	38
		90	89	82	-1.08	81	87	87	60
		101	83	86	-2.01	80	87	75	55
10	2	70	87	62	-1.33	62	46	75	60
		80	90	73	-.60	73	55	75	65
		91	100	92	-.16	91	78	87	60
11	1	74	69	53	-2.07	57	42	40	82
		84	81	70					
		94	83	80	-1.77	74	78	66	55
12	2	79	71	58	.43	71	60	49	46
		86	85	75	-.22	80	73	105	70
		98	88	88	.16	96	91	105	70
13	1	73	73	55	-3.00	40	42	37	55
		80	86	70	-1.51	67	51	49	70
		92	87	92	-1.88	73	64	66	76
14	2	72	83	61	-.64	67	37	80	55
		81	81	67	-.83	74	64	94	70
		93	108	102	-.07	82	60	105	88
15	2	68	89	61	-.81	66	37	75	104
		77	97	75	-1.35	68	51	75	46
		89	98	88	-.11	91	73	105	104
16	1	73	90	66	.05	62	46	75	55
		81	90	74	-.43	78	60	105	104
		94	92	88	-.97	82	87	94	76

9	10	11	12	13	14	15	16	17	18	19
47	52	72	64	61	77	63				
73	52	61	84	90	53	80	1.3	1.1	1.2	
70	61	76	102	56	65	83	1.4	1.7	1.9	1.0-
73	58	76	71	82	60	57				
82	72	107	102	73	77	72	1.7	1.8	1.6	
87	76	88	102	103	90	64	2.5	2.8	1.9	3.2
78	61	61	58	69	95	63				
78	52	49	94	99	55	69	1.7	1.6	1.2	
92	68	107	61	111	106	68	2.1	2.6	2.6	2.1
78	94	79	58	69	90	63				
87	81	107	67	107	106	69	1.8	1.6	1.7	
78	108	107	88	99	111	68	2.6	3.0	2.3	3.4
73	61	46	64	94	65	63				
63	72	86	58	61	57	70	1.7	1.9	1.5	
93	76	107	84	94	106	65	2.5	2.8	2.6	2.4
53	61	61	55	61	65	69				
66	64	76	88	86	60	77	1.3	1.4	1.6	
73	61	72	102	73	74	75	1.8	2.2	1.9	2.1
56	64	61	45	52	46	44				
63	50	46	52	65	53	69	1.3	1.2	1.6	
82	64	88	64	103	62	67	1.9	1.6	1.6	0
59	76	34	55	78	51	34				
82	58	76	71	90	106	56	1.6	1.4	1.6	
92	76	93	71	86	106	60	2.0	2.4	2.3	1.1
73	55	107	61	61	68	60				
87	68	107	58	82	106	81	1.6	1.0-	1.5	
87	72	93	61	94	106	45	1.9	2.2	1.2	1.3
44	50	76	75	82	60	63				
73	58	79	102	73	74	68	1.4	1.2	1.0-	
62	68	88	102	99	106	67	2.1	2.9	2.7	2.6
42	52	53	102	48	44	52				
						86	1.6	1.6	1.3	
82	68	68	102	65	65	61	2.3	2.2	2.2	2.3
50	68	49	102	90	106	26				
50	64	107	102	82	106	85	1.5	2.1	1.6	
78	107	83	102	86	90	76	3.0	4.6	3.0	3.8
37	40	31	64	44	68	72				
56	55	107	67	65	60	81	1.3	1.1	1.2	
70	72	107	102	52	60	77	1.7	1.8	2.1	1.0
63	68	107	64	56	68	40				
78	72	72	84	82	65	68	1.6	2.4	1.5	
73	94	79	102	85	74	64	2.8	3.9	2.3	2.7
63	52	61	102	52	60	66				
70	61	88	102	73	60	66	2.4	2.6	1.6	
82	72	76	102	82	106	64	4.6	3.5	3.4	4.9
63	44	49	102	61	51	46				
82	76	64	84	99	60	78	1.4	1.1	1.3	
87	64	107	102	73	57	74	2.0	2.2	1.8	1.9

Group VIII - SCRP plus One Year PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	74	64	50	-2.24	56	46	62	50
		81	80	66	-1.64	66	64	80	95
		93	75	72	-1.28	69	46	70	76
18	2	77	84	66	-3.00	53	28	80	35
		85	83	72	-.97	72	64	66	42
		96	94	92	-1.34	79	51	70	42
19	2	72	97	70	.32	74	55	87	70
		82	101	83	.38	88	100	87	104
		97	109	104	.75	105	100	105	104
20	2	73	102	74	-.04	78	78	80	107
		82	113	92	-.16	81	69	75	82
		94	103	98	-.11	91	69	105	104
21	2	80	72	60	-3.00	52	69	53	30
		88	83	75	-2.63	67	42	66	46
		98	94	94	-3.00	64	42	70	35
22	2	72	88	64	-1.50	61	51	105	95
		80	75	62	-2.04	64	51	94	82
		90	77	71	-2.58	67	42	62	76
23	1	86	80	71	-1.10	71	64	75	95
		94	85	82	-2.15	71	64	87	104
		104	80	86	-2.15	71	28	94	88
24	1	78	97	76	-1.16	69	78	62	104
		86	84	74	-.74	75	42	87	76
		96	90	88	-.42	87	51	94	88
25	2	86	83	73	-2.27	61	37	70	42
		94	83	80	-2.31	70	82	87	61
		104	71	76	-2.85	73	33	53	50
26	1	70	78	56	-2.12	57	46	105	38
		79	80	65	-1.91	65	33	80	46
		91	84	78	-1.88	73	60	75	70
27	1	69	108	74	1.45	81	46	94	70
		77	115	88	.14	79	87	75	95
		89	116	104	.59	102	96	80	95
28	1	75	104	78	-.73	72	46	105	76
		83	103	86	.11	85	64	80	82
		92	96	90	.32	97	100	70	88
29	2	70	86	61	-2.29	56	33	44	50
		79	80	65	.14	79	51	75	55
		91	95	88		86			
30	1	69	82	58	-2.75	53	37	66	35
		79	79	64	-.98	71	42	80	65
			86	80	-.81	84	64	105	60

9	10	11	12	13	14	15	16	17	18	19
47	47	79	64	48	57	59				
66	72	57	67	44	65	74	1.4	1.4	1.0-	
73	68	68	102	61	62	66	1.8	1.6	1.9	1.0-
44	61	38	102	48	42	38				
59	88	68	102	78	68	72	1.4	1.8	1.8	
73	68	83	102	103	81	62	2.9	3.2	3.3	4.7
53	76	88	30	90	57	70				
73	77	49	102	111	62	76	1.6	1.9	1.6	
87	94	107	102	99	60	77	2.9	3.2	3.4	4.0
56	108	88	52	86	55	51				
70	108	107	67	94	68	75	2.2	3.1	2.0	
73	94	107	84	94	85	81	3.0	4.6	3.4	4.2
50	76	38	43	69	46	31				
73	76	64	61	86	90	64				
73	81	64	61	86	68	67	3.0	2.8	3.3	2.5
50	47	53	84	40	57	68				
63	52	42	104	65	55	76	1.1	1.4	Inc.	
70	68	61	102	61	65	73	1.7	1.7	2.0	1.0-
59	88	64	94	65	62	66				
66	64	107	58	73	53	75	1.5	1.4	1.1	
70	72	93	58	61	95	77	2.0	2.0	2.1	1.6
59	58	61	84	73	68	70				
82	94	68	61	78	106	74	1.6	1.6	1.6	
87	88	107	71	84	106	70	3.7	2.9	3.1	3.2
73	58	107	58	48	57	53				
78	81	57	61	65	65	66	Inc.	1.3	1.1	
70	88	107	102	86	60	70	1.8	1.9	1.8	1.3
59	50	46	67	56	53	53				
70	76	79	67	73	57	69	1.1	1.0	1.3	
73	68	83	84	86	68		1.9	1.7	1.6	1.0-
70	64	107	84	90	106	63				
87	68	88	102	82	57	70	2.5	2.3	2.1	
92	72	107	102	111	95		4.9	4.9	3.7	4.2
82	94	68	102	33	65	56				
87	72	79	88	99	106	53	1.6	1.5	1.3	
92	108	107	102	86	95	68	2.9	2.4	2.6	2.2
63	55	57	79	52	55	48				
87	72	107	94	86	71	79	2.2	2.5	1.9	
						72	4.6	4.6	3.7	4.7
56	47	34	67	61	60	22				
73	55	107	71	73	71	66	1.7	1.9	1.7	
87	44	107	71	73	106	73	2.6	3.9	3.3	4.4

Group IX - SCRP plus Two Years PLDK

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	67	88	60	-1.37	57	42	62	55
		77	118	90	-.67	73	33	62	65
		89	100	90	.22	96	96	70	55
2	2	69	90	63	-.93	65	73	62	95
		79	93	74	-1.97	64	60	70	35
		91	86	80	-2.10	69	55	53	65
3	2	81	77	64	-1.91	64	37	87	35
		88	87	78	-1.56	76	60	80	50
		100	71	73	-1.89	81	73	80	65
4	1	82	94	78	-.20	81	82	75	76
		89	105	94	-.43	88	82	94	82
		101	94	100	-1.65	84	91	105	76
5	1	79	104	81	-.73	72	69	105	46
		86	109	94	-.02	83	87	87	82
		98	92	92	-.86	83	82	75	76
6	1	72	105	75	-.93	65	37	70	76
		81	122	98	.74	93	78	80	104
		92	108	102	.54	101	73	105	82
7	2	88	75	68	-3.00	58	46	32	50
		95	82	70	-2.15	71	55	87	50
		104	82	88	-2.07	80	91	80	82
8	2	72	82	60	-1.33	62	55	57	65
		82	78	66	-2.05	63	42	66	38
		93	88	84	-.91	82	60	75	50
9	1	77	86	67	-2.47	62	60	80	50
		85	88	76	-.07	82	64	75	42
		96	92	90	-.05	92	73	70	65
10	1	76	88	68	-2.41	62	60	75	50
		86	119	102	.38	88	73	94	76
		97	122	120	.54	101	105	105	88
11	1	78	86	68	-2.16	63	64	87	70
		88	96	86	-1.18	80	69	94	65
		99	109	98	-1.23	88	82	105	70
12	2	73	88	65	-3.00	55	46	49	70
		83	88	75	-.97	72	55	94	60
		94	94	90	-.91	82	73	87	50
13	1	79	106	84	-1.29	69	60	80	104
		89	102	92	-1.83	74	69	87	76
		99	109	110	-.57	95	78	105	76
14	2	77	86	67	-.85	72	78	57	104
		85	103	88	.38	88	69	62	76
		93	115	108	.38	98	82	90	76
15	1	69	89	62	-2.92	52	46	32	55
		79	93	74	-2.04	64	60	44	46
		90	84	77	-1.34	78	91	70	42
16	2	75	72	56	-3.00	49	42	57	35
		83	68	59	-2.91	56	28	75	38
		94	70	68	-2.15	71	64	75	50

9	10	11	12	13	14	15	16	17	18	19
70	64	49	50	65	51	30				
66	72	83	102	99	77	64	1.9	2.4	1.8	
108	81	93	102	94	106	71	3.0	4.6	3.3	4.0
53	61	107	55	61	57	69				
73	76	107	55	65	57	73	1.1	1.3	1.5	
73	68	107	78	69	95	78	2.0	2.2	2.6	1.9
66	64	61	61	82	81	50				
78	81	79	75	99	85	51	1.8	1.7	1.7	
82	101	107	71	99	74	67	2.6	3.2	2.3	3.2
82	55	107	67	94	85	69				
87	64	107	79	90	106	83	1.7	1.7	1.7	
108	68	72	71	99	85	74	2.0	3.4	1.8	2.7
99	61	68	61	86	77	64				
87	58	83	94	86	95	82	1.4	1.8	1.7	
92	68	72	102	99	85	71	3.5	3.9	2.5	3.4
70	88	72	67	65	51	56				
108	76	107	102	86	81	83	1.7	1.8	1.6	
99	108	83	102	107	90	80	2.7	2.4	2.0	2.0
59	64	76	58	78	55	66				
66	76	107	64	65	71	68	1.6	1.8	1.7	
82	72	107	75	52	81	73	2.6	2.3	2.1	2.7
53	72	76	64	61	57	24				
70	64	107	67	65	46	71	1.6	1.5	1.6	
92	76	107	102	73	74	71	2.9	3.2	2.1	3.8
73	61	57	55	82	60	59				
87	68	107	102	94	85	69	1.3	1.9	1.5	
87	72	107	102	94	95	59	3.2	2.5	2.2	3.8
63	58	68	71	52	57	71				
73	76	107	84	78	106	77	1.8	2.5	1.7	
99	108	107	102	61	57	78	2.7	3.2	2.5	4.0
56	64	76	55	65	51	53				
82	64	107	67	78	77	71	1.7	1.7	1.5	
82	108	93	67	103	77	72	2.6	3.2	2.3	3.2
50	55	61	55	56	56	32				
73	76	88	67	86	65	58	1.6	1.8	1.6	
78	88	107	102	78	74	67	2.7	2.6	3.0	4.9
66	61	76	61	94	51	24				
99	72	76	64	82	62	77	1.9	2.4	1.7	
92	108	107	102	111	106	72	3.3	4.3	2.8	4.9
73	64	88	71	65	60	59				
78	88	107	102	90	106	72	1.7	2.4	1.3	
99	108	107	102	78	77	80	2.7	2.6	2.3	3.8
44	64	42	50	56	62	51				
53	50	76	58	69	81	71	1.3	1.6	1.1	
73	72	107	79	90	74	77	1.8	2.1	1.9	2.6
50	58	57	41	48	51	34				
59	61	57	43	69	65	63	1.1	1.4	1.5	
73	64	107	52	86	81	65	1.7	1.5	2.5	1.0-

Group IX - SCRP plus Two Years PLDK (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	78	65	53	-3.00	49	42	66	38
		88	75	68	-3.00	61	46	40	46
		100	70	72	-3.00	66	73	66	50
18	1	69	100	69	.27	73	91	80	88
		79	106	84	-.36	75	78	62	65
		91	102	94	-.81	84	91	87	70
19	2	77	96	74	-1.73	66	51	62	50
		85	105	90	.20	86	78	70	60
		97	101	100	-.16	91	91	105	65
20	1	72	93	67	-1.38	62	42	70	60
		79	93	74	-.79	72	69	75	88
		90	103	94	-.65	85	69	87	104
21	2	73	76	57	.10	72	73	57	76
		80	97	78	-.73	72	60	66	85
		94	103	98	-.22	90	69	105	88
22	1	72	79	58	-3.00	45	27	66	46
		80	74	61	-2.04	64	46	62	46
		91	75	70	-3.00	65	42	66	42
23	2	68	99	67	-1.21	63	60	75	70
		78	108	84	-.67	73	91	75	65
		90	94	86	-1.24	79	91	70	60
24	2	74	72	55	-3.00	53	28	62	50
		84	75	65	-1.10	72	60	66	55
		96	69	69	-2.96	65	28	80	46
25	2	69	84	59	-2.58	54	33	62	38
		77	87	68	-1.73	66	51	66	35
		88	99	88	-1.83	74	33	80	33
26	1	78	82	65	-2.47	62	46	53	50
		87	90	80	-2.85	73	64	80	65
		99	93	94	-1.34	78	69	66	55
27	1	67	100	67	.28	69	51	94	50
		77	110	84	.58	83	78	75	88
		89	107	96	.20	86	69	105	70
28	1	72	99	71	-.02	71	69	62	56
		82	97	80	-.65	76	69	94	50
		94	89	86	-1.72	75	73	70	50
29	2	71	85	61	-1.33	62	46	57	70
		80	89	72	-1.42	68	55	75	50
		92	85	80	-2.47	69	46	70	70
30	2	71	89	64	.32	74	78	70	104
		80	108	86	-.74	75	51	70	50
		92	105	98	.00	93	64	70	95

9	10	11	12	13	14	15	16	17	18	19
50	58	49	50	31	46	14				
66	81	83	50	82	55	58	1.6	1.6	1.6	
66	61	83	71	73	55	38	3.9	4.3	3.3	4.0
73	72	49	50	82	106	47				
87	68	107	61	82	85	65	1.5	1.6	1.7	
78	72	107	61	99	106	75	2.2	3.0	2.0	3.0
59	81	68	75	94	57	54				
73	108	107	102	78	71	79	2.0	2.4	1.6	
73	88	107	102	94	57	69	3.5	4.3	3.3	4.9
59	68	72	61	56	62	61				
73	68	83	61	56	85	81	1.6	1.3	1.5	
87	88	88	84	94	77	79	2.8	3.4	3.1	2.4
63	108	64	75	69	81	56				
82	81	107	71	78	60	71	2.1	2.2	1.7	
82	88	107	102	90	90	72	3.0	4.6	3.1	4.2
37	61	46	37	52	40	53				
59	72	76	45	69	106	65	1.0	1.0-	1.1	
66	72	68	61	82	77	73	2.4	3.6	2.4	1.0-
73	50	79	75	52	46	59				
87	58	79	64	48	106	77	1.8	1.9	1.6	
82	68	88	88	86	81	68	2.7	3.9	2.4	4.4
66	52	49	58	61	46	47				
56	68	64	102	82	81	64	1.4	1.0	1.5	
59	64	107	71	86	57	70	1.0	1.5	1.9	2.4
47	68	34	102	56	42	64				
63	72	76	102	65	62	77	1.3	1.8	1.6	
78	68	49	102	86	106	74	2.8	3.6	2.5	3.8
70	46	64	75	90	65	33				
78	76	83	102	65	62	52	1.9	2.1	1.3	
92	108	88	102	86	62	64	2.9	3.9	2.5	2.6
66	58	107	75	56	81	67				
99	68	107	88	56	62	69	1.8	1.9	1.5	
92	61	107	102	107	57	67	3.0	3.9	2.7	3.8
70	58	107	79	82	62	39				
78	64	107	102	86	55	55	1.6	1.4	1.5	
73	61	76	102	90	81	70	3.1	3.6	2.6	3.4
44	61	93	43	94	65	55				
73	76	93	64	73	57	74	1.9	1.9	1.5	
73	68	76	64	99	60	76	2.9	3.9	2.6	3.8
70	72	107	47	99	62	50				
87	108	107	61	86	65	85	1.4	1.8	1.9	
92	108	107	102	90	74	75	2.0	3.0	2.3	2.5

Group X - Control

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
1	2	72	93	67	-1.21	63	37	70	42
		82	81	68	-1.33	69	78	70	65
		92	92	86	-2.85	66	55	70	50
2	2	72	79	58	-3.00	48	37	62	35
					-2.64	58	42	40	38
		92	79	75	-3.00	64	37	70	45
3	1	73	73	55	-3.00	50	42	62	38
		81	80	66	-3.00	51	46	40	46
		92	83	78	-3.00	64	42	62	33
4	2	72	80	59	-2.86	52	51	49	42
		80	72	60	-2.47	62	51	62	42
		90	77	71	-3.00	62	42	80	42
5	1	76	71	56	-2.85	59	37	57	38
		85	95	82	-2.14	62	60	87	42
		96	77	76	-2.31	70	37	44	38
6	1	71	74	54	-2.41	55	37	49	65
		79	75	61	-.42	75	69	75	95
		90	81	75	-2.96	65	73	62	42
7	1	68	85	59	-1.52	55	33	62	55
		78	93	73	-.67	73	55	105	82
		88	84	76	-1.83	74	64	62	60
8	1	73	86	64	-1.33	62	78	62	46
		81	92	75	-.43	78	87	87	76
		91	95	88	-1.67	75	60	80	60
9	2	69	87	61	-2.75	53	37	36	42
					-2.10	64	73	87	65
		88	68	62	-3.00	62	46	80	42
10	1	71	89	64	-.64	67	51	75	60
		81	93	76	-.92	73	105	80	88
		91	97	90	-.43	88	100	105	88
11	2	79	73	60	-1.79	66	33	62	60
		88	82	74	-1.56	76	37	57	60
		99	78	80	3.00	68	28	75	55
12	2	76	81	63	-1.97	64	46	66	95
		85	73	64	-2.00	63	42	57	55
		96	73	72	-3.00	61	37	66	33
13	1	77	93	65	-1.48	67	46	87	65
		87	90	80	-.65	85	60	105	104
		97	84	84	-1.02	81	69	105	65
14	2	78	82	65	-1.60	67	42	80	42
		85	78	68	-.97	72	42	80	46
		94	76	74	-1.83	74	55	80	42
15	1	78	103	80	-.34	79	96	105	35
		88	83	75	-.59	86	114	105	30
		99	86	87	-.27	90	114	105	30
16	2	70	91	64	-2.66	60	64	57	35
		77	94	73	.02	78	73	80	42
		88	86	77	-.65	85	82	70	46

9	10	11	12	13	14	15	16	17	18	19
70	68	64	84	40	77	60				
78	72	57	75	78	60	69	1.6	1.6	1.5	
78	76	88	64	44	65	75	2.1	2.7	2.2	3.2
50	47	38	55	44	53	34				
56	88	57	71	86	46	29	1.2	1.0-	1.1	
56	76	72	71	94	65	68	2.2	1.4	1.8	1.0-
32	52	53	64	56	51	35				
39	55	49	71	65	46	39				
70	64	64	94	48	95	55	1.7	2.1	2.0	1.3
34	52	64	75	61	44	60				
47	40	43	64	82	106	68	1.3	1.2	1.5	
59	61	61	71	86	55	45	1.1	1.3	2.0	1.0
47	61	79	102	44	60	77				
56	55	64	88	69	55	42	1.0-	1.3	1.3	
73	108	79	102	61	77	69	1.5	1.5	1.8	1.0-
66	47	68	75	40	46	55				
78	68	107	67	73	68	30	1.4	1.4	1.5	
92	64	68	75	52	60	67	1.2	1.4	1.7	1.0-
63	64	53	52	65	49	24				
73	76	53	71	99	65	24	1.7	1.6	1.5	
87	72	76	64	86	106	55	2.0	1.8	1.9	1.1
63	68	57	75	44	62	61				
78	64	53	75	90	106	64	1.4	1.5	1.5	
82	72	79	102	69	74	68	1.4	2.6	2.0	2.1
44	64	61	71	56	51	55				
53	64	53	61	73	57	35	1.2	1.2	1.2	
59	88	82	71	56	44	69	1.7	1.5	1.7	1.0
70	61	68	61	90	68	63				
73	68	68	67	78	55	67	1.7	1.9	1.6	
99	68	107	64	82	74		2.3	2.6	3.0	2.1
56	58	68	94	65	106	32				
70	76	93	102	99	77	60	1.1	1.4	1.6	
78	68	88	75	86	62		1.5	1.8	1.8	1.4
59	61	61	79	78	53	39				
66	72	49	102	73	57					
66	64	61	102	52	57	62	1.7	1.9	1.6	1.9
63	64	49	61	78	106	58				
78	61	76	79	94	106	68	1.5	1.2	1.3	
78	88	72	84	86	106	70	1.8	1.8	2.0	1.1
70	58	88	75	73	71	70				
73	68	79	84	94	85	66				
82	72	107	94	78	53	75	1.6	1.8	1.6	
78	94	64	75	94	90	38	2.5	3.2	2.0	4.0
82	108	79	94	82	81	36	1.9	2.4	1.8	
108	94	42	102	111	95	40	2.7	2.9	2.5	2.1
47	72	64	64	61	71	33				
70	101	72	102	82	95	68	1.9	2.0	2.0	
92	108	68	102	94	106		2.9	3.2	2.7	2.3

Group X - Control (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
17	1	77	90	70	-2.04	64	60	66	42
		84	88	75	-.88	73	73	80	60
		95	92	89	-.91	82	100	87	60
18	2	74	90	67	-1.23	69	69	70	50
		83	79	67	-.16	81	78	105	55
		94	76	74	-3.00	71	82	75	50
19	2	77	84	66	-3.00	54	60	49	33
		84	76	66	-1.06	72	73	94	46
		95	80	78	-1.34	78	69	70	60
20	2	71	83	60	-1.10	64	64	66	55
		81	78	65	-1.69	66	73	87	50
		89	90	82	-1.61	79	100	80	60
21	1	68	77	54	-2.63	54	46	53	55
		77	78	62	-3.00	56	28	57	42
		88	81	73	-3.00	63	51	57	60
22	2	78	83	66	-1.79	66	60	66	70
		88	82	74	-2.47	69	73	53	65
		99	80	82	-1.45	77	87	62	70
23	1	72	99	71	-.13	70	73	87	70
		81	96	78	.34	86	91	105	65
		93	115	108	-.75	84	87	105	88
24	2	70	94	66	-1.72	60	37	66	70
		79	91	73	-.85	72	51	94	95
		90	99	90	1.18	80	82	75	88
25	1	82	84	70	-1.55	67	46	80	82
		89	95	86	.58	83	55	94	95
		100	98	100	-1.17	88	60	87	104
26	2	81	104	84	-1.19	70	78	66	46
		88	92	82	-1.88	73	87	75	46
		99	91	92	-1.23	88	87	56	55
27	2	71	93	60	-2.07	57	46	60	42
		80	94	76	-2.46	60	55	57	42
		91	88	82	-2.20	71	64	70	50
28	2	74	79	60	-1.72	60	60	53	50
		82	94	78	-1.42	68	60	66	70
		94	92	88	-.91	82	87	62	46
29	2	73	105	76	-.47	68	69	80	70
		80	105	84	-.43	78	78	57	70
		92	105	98	-.65	85	82	66	82
30	1	74	99	73	-1.78	59	37	62	55
		80	86	70	-1.91	64	33	105	42
		92	89	94	-1.51	77	69	94	65
31	2	72	94	68	-.79	72	73	57	76
		82	110	90	-.11	82	73	87	65
		93	115	108	-.38	88	100	87	76
32	2	68	87	60	-.54	63	42	49	70
		90	87	80	-1.13	80	69	62	70

9	10	11	12	13	14	15	16	17	18	19
63	81	61	52	65	85	42				
78	88	107	55	73	74	67	1.8	1.5	1.7	
92	88	88	67	99	71	67	2.4	2.5	2.7	2.1
73	101	72	75	52	58	13				
78	64	76	102	99	71	67	1.5	1.7	1.8	
78	68	68	102	69	60	63	2.7	3.4	2.2	4.7
50	64	42	64	56	55	35				
73	76	68	102	69	55	54	1.5	2.5	1.8	
82	76	83	79	86	106	65	2.2	3.2	2.3	2.7
59	108	64	55	69	53	28				
82	81	67	67	44	50	38	1.7	2.4	1.7	
78	94	68	88	94	65	87	2.7	3.2	3.0	3.4
47	61	49	64	69	40	64				
50	81	46	71	56	57	63	1.3	1.4	1.6	
56	76	68	75	73	53	64	1.7	1.9	2.0	2.1
63	50	64	102	48	68	38				
78	64	83	88	65	57	58	1.6	1.4	1.5	
87	61	72	102	78	65	56	1.7	1.7	1.9	2.6
66	88	64	58	65	77	34				
78	108	49	88	107	106	54	1.8	1.9	2.0	
82	81	61	102	94	77		2.7	2.8	4.2	1.9
29	58	64	64	48	77	81				
66	58	57	94	69	85	75	1.8	1.8	1.7	
78	58	107	102	61	65	69	2.8	2.7	2.8	2.3
73	68	53	75	52	77	39				
87	81	68	75	103	106	57	1.6	1.6	1.5	
108	81	93	79	111	81	59	1.7	2.1	2.2	1.9
70	68	93	102	61	57	56				
99	68	72	102	65	65	60	1.9	2.2	2.0	
87	81	76	102	90	106	57	2.7	3.2	3.3	3.2
63	55	57	61	65	53	31				
63	68	57	67	69	53	64	1.6	1.5	1.7	
75	68	88	94	86	55	75	2.2	2.4	2.3	2.2
56	64	79	55	65	53	60				
78	68	57	64	90	68	86	1.6	1.9	1.9	
99	72	93	75	103	106	91	2.4	3.2	2.6	3.2
72	68	88	45	65	62	67				
87	64	107	67	82	90	70	1.9	2.3	2.0	
87	68	107	61	107	90	73	2.9	2.7	3.3	3.8
70	50	68	71	44	65	40				
82	58	61	67	73	65	54	1.3	1.3	1.7	
78	68	72	94	78	85	61	1.9	1.7	2.0	1.3
70	88	49	102	73	60	62				
82	72	61	102	86	90	64				
82	108	72	102	99	57	71	3.5	4.6	4.0	4.9+
63	52	107	75	61	57	86				
73	68	107	102	73	106	69	1.8	2.3	1.9	1.0-

Group X - Control (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
33	2	73	80	60	-2.04	64	46	105	55
		82	99	82					
		94	83	80	-2.53	68	64	94	65
34	1	68	82	57	-2.78	46	28	36	46
		77	77	61	-3.00	53	28	44	42
		88	73	66	-1.82	65	51	87	60
35	1	76	75	59	-2.16	63	42	57	50
		83	85	72	-1.01	72	55	62	82
		94	72	70	-1.56	76	60	75	50
36	1	68	100	68	-.64	62	33	75	60
		77	104	80	.45	82	51	105	88
		88	123	108	.65	103	91	105	104
37	1	76	75	59	-3.00	55	42	70	70
		83	77	66	-1.01	72	51	66	82
		94	87	84	-1.61	76	51	62	60
38	2	69	86	60	-1.95	58	55	87	50
		78	90	83	-1.54	67	60	75	46
		89	93	84	-1.94	73	64	94	42
39	2	74	84	63	-.76	66	60	87	46
		81	89	73	-1.06	72	78	53	50
		92	85	80	-.43	88	91	87	55
40	2	69	69	50	-2.46	55	60	36	50
		78	79	63	-3.00	55	69	57	50
		89	73	67	-2.63	67	55	70	50
41	2	71	99	70	-1.27	63	37	70	60
		80	100	80	-.38	79	82	53	104
		91	102	94	-1.29	79	78	80	60
42	1	76	85	66	-2.22	63	46	105	50
		86	87	76	-.20	81	69	87	65
		97	89	88	-1.29	79	82	80	60
43	1	71	78	57	-2.58	54	28	57	42
		78	83	68	-2.00	63	55	70	55
		93	79	76	-2.37	69	60	87	55
44	1	77	86	67	-1.79	66	55	75	95
		86	77	68	-1.06	72	69	87	76
		97	84	84	-.27	91	96	87	70
45	2	73	94	69	-2.72	60	33	80	50
		82	86	72	-1.46	68	46	53	38
		93	77	74	-.48	87	64	66	55
46	2	72	88	64	-1.61	60	28	49	46
		79	90	72	-1.66	66	51	94	46
		90	92	84	-1.77	74	60	62	42
47	1	77	64	52	-3.00	52	37	57	50
		86	66	59	-2.14	62	51	87	46
		97	67	67	-2.90	66	51	66	46
48	2	80	60	51	-3.00	52	28	66	35
		87	67	61	-3.00	62	37	66	42
		98	66	67	-1.51	67	60	57	55

9	10	11	12	13	14	15	16	17	18	19
63	58	68	71	65	60	32				
						51				
78	81	49	67	78	57	81	2.2	2.2	1.9	2.6
39	64	46	39	52	53	31				
47	68	46	55	90	51	50	1.2	1.5	1.6	
44	76	46	52	82	106	58	1.9	1.6	1.9	2.0
63	88	68	64	73	62	64				
73	76	88	71	99	57	65				
78	88	107	88	73	77	74	1.9	1.8	1.7	1.8
59	52	83	61	78	60	43				
87	68	88	102	86	85	75	2.0	2.3	1.9	
87	108	107	102	99	77	75	3.0	3.6	3.7	3.4
44	55	42	55	82	49	66				
70	72	107	67	90	53	60	1.4	1.3	1.2	
70	88	107	102	90	68	64	1.8	1.6	1.7	1.0-
59	52	45	55	65	51	63				
70	76	93	61	69	60	64	1.6	1.7	1.3	
73	101	93	64	86	62	73	2.3	2.3	2.2	1.6
73	55	57	67	78	74	66				
78	64	107	71	69	81	65	1.9	2.4	1.8	
78	68	107	102	94	81		2.9	2.9	3.1	2.7
37	50	88	50	73	55	73				
39	61	49	61	52	55	64	1.5	1.4	1.5	
78	64	83	61	78	68		2.2	2.8	2.2	2.1
59	58	79	71	69	57	60				
82	81	83	102	86	57	65	1.6	1.6	1.7	
78	101	107	94	69	55	67	2.2	3.0	2.4	2.3
44	64	57	59	90	65	26				
78	68	107	71	82	106	69	1.3	1.4	1.5	
87	76	79	103	99	74	63	2.0	2.0	2.1	2.2
37	52	53	67	82	60	53				
56	72	49	71	52	81	52	1.2	1.2	1.7	
70	81	72	84	90	55	69	1.8	1.9	2.0	1.8
63	61	76	61	69	55	58				
66	64	53	71	99	76	85	1.5	1.2	1.0	
78	72	107	102	78	106	66	1.7	1.7	1.9	1.0-
63	76	49	61	56	65	56				
73	88	61	102	78	71	70	1.9	1.9	1.5	
78	101	107	102	86	106		2.6	2.7	2.8	3.4
53	61	88	64	90	57	37				
87	68	68	71	69	55	65	1.7	1.6	1.6	
78	64	93	94	82	106	63	2.2	2.0	2.2	2.0
47	52	38	58	61	60	43				
63	64	68	71	56	55	50	1.3	1.4	1.3	
73	68	72	94	69	55	58	1.8	1.6	2.0	1.0
50	55	46	61	56	55	34				
59	28	64	64	73	60	61	1.2	1.2	1.0	
70	72	107	67	78	57	83	1.8	1.6	2.0	1.0-

Group X - Control (cont.)

Subjects / Variables

	Sex	1	2	3	4	5	6	7	8
49	1	81	80	66	-2.41	60	42	87	70
		88	80	72	-3.00	60	46	94	46
		100	82	84	-2.85	73	78	80	55
50	1	67	92	62	-.40	64	48	66	76
		77	91	71	-.11	77	42	94	70
		89	98	88	.00	93	64	94	82
51	1	68	85	59	-1.84	59	60	75	55
		78	77	62	-2.10	64	33	82	46
		90	81	75	-2.26	70	60	87	55
52	1	73	79	59	-2.40	55	33	53	60
		83	77	66	-2.09	63	33	75	55
		95	70	69	-2.53	68	37	94	70
53	1	71	102	72	-.76	66	64	80	55
		79	91	73	-.11	77	78	70	76
		90	110	100	.11	95	91	94	70
54	2	69	107	73	-.93	65	42	49	55
		78	82	65	-2.97	69	60	57	60
		90	92	84	-1.02	81	78	70	55
55	1	78	72	58	-2.97	58	60	70	38
		88	80	72	-3.00	63	64	62	70
		99	72	74	-2.91	73	69	80	65
56	1	67	70	49	-1.90	58	33	94	60
		77	78	62	-2.41	62	37	87	60
		88	71	65	-3.00	64	37	87	50
57	1	78	84	67	-1.85	65	60	87	76
		85	98	84	-.83	74	73	57	88
		96	104	102	-.65	85	73	80	55
58	1	78	87	69	-1.66	66	55	75	60
		88	87	78	-1.94	73	51	94	60
		99	85	86	-1.72	75	51	80	60
59	2	70	81	58	-2.29	56	42	62	65
		78	82	64	-.73	72	82	80	60
		88	82	74	-1.56	76	91	94	88
60	2	68	90	62	-2.60	61	42	53	46
		78	93	73	-.04	78	60	57	60
		89	90	82	-1.13	80	64	70	42

9	10	11	12	13	14	15	16	17	18	19
47	76	57	61	61	51	64				
56	61	72	64	48	53	52	1.2	1.3	1.2	
70	72	107	88	69	57	40	1.4	2.2	2.7	2.3
47	76	76	88	40	65	53				
63	81	107	102	69	62	69				
70	81	107	102	78	106	75	1.8	1.7	1.9	1.0-
47	55	72	55	61	55	25				
56	81	93	61	78	62	63	1.5	1.5	1.3	
66	72	107	61	78	65	70	1.9	2.4	2.1	2.0
53	55	57	61	69	49	44				
59	68	61	64	69	71	59				
70	68	83	67	82	60	57	1.9	1.9	1.9	1.0-
70	55	88	71	61	57	57				
87	76	107	67	78	74	69				
73	72	107	102	103	90	76	3.9	4.3	3.8	4.0
73	68	57	102	61	60	70				
78	81	76	79	69	68	58	1.7	1.6	1.8	
78	108	72	102	99	74	62	2.0	2.4	3.1	2.1
50	47	57	67	69	65	49				
59	55	76	58	78	53	79	Inc.	Inc.	Inc.	
66	68	107	75	78	65	71	1.8	1.7	2.0	1.0-
39	58	42	50	65	95	38				
47	64	46	67	73	74	54	1.6	Inc.	Inc.	
53	81	79	67	78	53	65	1.7	1.7	1.9	1.0-
73	61	57	71	64	51	61				
78	64	88	75	86	68	64	1.5	1.5	1.9	
78	88	107	75	94	90	69	1.9	2.0	2.1	1.6
66	52	72	58	78	85	53				
73	72	107	64	78	71	63	1.3	1.4	1.2	
82	61	107	67	78	77	72	1.9	2.0	2.1	1.3
47	58	53	58	48	62	63				
66	61	107	71	94	57	75				
73	61	107	71	86	55	68	2.0	1.7	1.8	1.6
66	72	49	79	82	53	84				
78	88	107	102	86	62	92	Inc.	Inc.	1.7	
78	72	107	102	86	62	93	2.3	2.4	2.6	2.3